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WESTERN WATER BULLETIN 1986

**Flow of
The Colorado River
and other
Western Boundary Streams
and
Related Data**

COLORADO RIVER

TIJUANA RIVER

SANTA CRUZ RIVER

SAN PEDRO RIVER

WHITEWATER DRAW

1986

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FOREWORD

This bulletin is the twenty-seventh annual compilation of stream discharges and other hydrographic data relating to international aspects of the Colorado River below Imperial Dam, the Tijuana River, and other streams crossing the western land boundary of the United States and Mexico. The compilation was prepared jointly by the United States and Mexican Sections of the International Boundary and Water Commission, solely for the purpose of presenting statistical data relating to stream flow and kindred subjects for the Colorado River from Imperial Dam to the Gulf of California, the Tijuana River and its important tributaries in the United States and Mexico, and other streams, including the Alamo and New Rivers which cross the California-Baja California boundary, and the Santa Cruz River and Whitewater Draw which cross the Arizona-Sonora boundary. This bulletin contains information for the year 1986.

Stream gaging on the Colorado River below Imperial Dam began in 1902 when the station at Yuma, Arizona was established. Stage records were obtained at this station from January 1878 until December 1973, when it was discontinued. Continuous stream gaging on the Tijuana River and its important tributaries in the United States and in Mexico began in 1936. Each government operates the gaging stations located within its own country.

COLORADO RIVER BELOW IMPERIAL DAM

Below Imperial Dam, the Colorado River flows southward 10 miles to the mouth of the Gila River, thence westward 11 miles to Pilot Knob Mountain, and south 1 mile to the point where the northerly international land boundary, between California and Baja California, intersects the river. From this point the river continues to flow southward and forms the boundary between the United States and Mexico for a distance of about 22 miles to the point where the southerly international land boundary between Arizona and Sonora intersects the river. From this point the river continues to flow southward about 90 miles to discharge into the Gulf of California.

The ordinary flows of Colorado River below Imperial Dam are largely controlled by releases at Hoover Dam, completed in 1935. The releases are further regulated at Davis Dam, completed in 1950, and by Parker and Imperial Dams, completed in 1938. Small amounts of runoff may occasionally be contributed to the flow in the lower river from the usually dry arroyos draining the 10,900 square miles along the river from Hoover Dam to the mouth of the Gila River. In addition, flows ranging from usually minor amounts to infrequent torrential floods may enter the lower Colorado River from the Bill Williams River, draining about 717 square miles below Alamo Dam and Lake, completed in 1963; and from the Gila River, draining about 7,300 square miles below Painted Rock Dam and Reservoir, completed in January 1960.

At Imperial Dam, diversions are made to Gila Gravity Main Canal and All-American Canal for irrigation projects in Arizona, including the Yuma Valley, Gila and Wellton-Mohawk projects; and in California, including the Imperial Valley, Coachella Valley and Reservation Division of Yuma Project. Also, under the provisions of the 1944 Water Treaty, there may be diverted to the All-American Canal at Imperial Dam for delivery to Mexico in the Alamo Canal, or substitute canal, at the northerly boundary, a portion of Mexico's scheduled deliveries of waters of the Colorado River, which in 1986 amounted to 1,700,000 acre-feet, in accordance with Article 10 of the 1944 Water Treaty. No diversions were made to a substitute canal in 1986.

Below Laguna Dam, measured and unmeasured flows are returned to the river principally as waste and drainage water from the irrigation projects in the United States. Waste and drainage waters from irrigation projects in the United States also cross the boundary into Mexico near San Luis, Arizona without returning to the river in the United States.

In the limitrophe section of the river, 1.1 miles downstream from the northerly boundary, Morelos Dam, the principal diversion structure for Mexico, was completed and placed in operation on November 8, 1950. Since that date almost all the Colorado River flows that cross the northerly boundary (except emergency deliveries to Tijuana from August 1972 to August 1980) have been diverted to the Alamo Canal at Morelos Dam.

TIJUANA RIVER BASIN

The total drainage area of the Tijuana River basin is 1,731 square miles, of which 27 percent lies in the United States and 73 percent in Mexico. This river is formed by the principal tributaries, Cottonwood Creek, which rises in the United States and Rio de las Palmas, which rises in Mexico. Cottonwood Creek crosses the international land boundary 21 miles from the Pacific Ocean to join the Rio de las Palmas in Mexico. From the confluence of these tributaries, the Tijuana River flows northwesterly 5 miles to cross the land boundary into the United States near San Ysidro, California and Tijuana, Baja California, and then flows westerly 6 miles to discharge into the Pacific Ocean 2 miles north of the boundary. The flow of Cottonwood Creek is partially controlled by Barrett and Morena Reservoirs in the United States, and the flow of the Rio de las Palmas is partially controlled by Rodriguez Reservoir in Mexico.

WHITewater DRAW NEAR DOUGLAS, ARIZONA

Whitewater Draw rises in the United States and flows south into Mexico, crossing the international boundary near Douglas, Arizona, eventually discharging into the Gulf of California through the Yaqui River in Mexico. The total drainage area above the Douglas Gaging Station is 1,023 square miles. A number of mountain streams in the upper reaches of the basin are diverted for irrigation, but they would normally sink or go to ground water before reaching the main water course.

FOREWORD

SAN PEDRO RIVER AT PALOMINAS, ARIZONA

The San Pedro River rises in Mexico and flows north into the United States, crossing the boundary near Palominas, Arizona and thence northwesterly into the Gila River. The river in the vicinity of the international boundary drains an area of 741 square miles, of which 649 square miles are in Mexico.

SANTA CRUZ RIVER NEAR NOGALES AND LOCHIEL, ARIZONA

The Santa Cruz River rises in the United States and flows south into Mexico, crossing the international boundary near Lochiel, Arizona and returning to the United States near Nogales, Arizona, eventually discharging into the Gila River southwest of Phoenix, Arizona. The drainage area of the Santa Cruz River above Nogales station is 533 square miles. Of this amount, 348 square miles lie in Mexico. There are a few ground water irrigation diversions above the Lochiel station in Arizona and an unknown amount of water diverted for irrigation in Mexico.

ACKNOWLEDGMENTS

Other agencies which have contributed to the data published herein include the Bureau of Reclamation and the Geological Survey of the U. S. Department of the Interior; the National Weather Service, Department of Commerce; the Yuma County Water Users' Association; the Imperial Irrigation District; the city of San Diego, California; the Otay Municipal Water District; and the Ministry of Agriculture and Hydraulic Resources of Mexico. Specific notation is made of each of the above named agencies, where the data appear. The courtesy and cooperation of those who have made these contributions are acknowledged with appreciation.

UNITS OF MEASURE

Data collected by the Mexican Section are computed and published in a Spanish version of the water bulletin in metric units. The Mexican data are converted and reported in this bulletin in English units. Conversion factors conform generally to those in the National Bureau of Standards Miscellaneous Publication 286 "Units of Weight and Measure (United States Customary and Metric) - Definitions and Tables of Equivalents." However, for convenience some of the factors have been shortened and modified to facilitate conversion, reconversion to the original units when necessary, and checking of data. Conversion of the mean daily discharges, the monthly average discharge, and the monthly and annual volumes from metric to English units is direct. For this reason the monthly average discharge in cubic feet per second and monthly volumes in acre-feet shown for gaging stations operated by the Mexican Section cannot necessarily be obtained in the usual manner from the total monthly flow in second-foot days. For the same reason, evaporation and rainfall data, when totaled, may not be equivalent to the direct conversion from metric to English units. The following factors have been used for data in this bulletin:

METRIC UNITSENGLISH UNITSLENGTHS

1 Centimeter
1 Meter
1 Kilometer

0.39370 Inch
3.28084 Feet
0.62137 Mile

AREAS

1 Square Meter
1 Hectare
1 Square Kilometer

10.76391 Square Feet
2.47105 Acres
0.38610 Square Mile

VOLUMES

1 Cubic Meter
1 Cubic Meter
1 Cubic Meter
1000 Cubic Meters
1 Liter

61023.74 Cubic Inches
35.31467 Cubic Feet
1.30795 Cubic Yards
0.81071 Acre-Foot
0.26417 U.S. Gallon

WEIGHTS

1 Kilogram
1 Metric Ton
1 Metric Ton

2.20462 Pounds
2204.623 Pounds
1.10231 Short Tons
(2,000 lbs.)

Both English and metric units are used to report the figures in the descriptive headings and for the yearly figures of the annual and period summaries of all gaging station pages. The yearly figures for the summaries are obtained by direct conversion from English to metric system of units, except for those stations operated by the Mexican Section, where the figures furnished in the metric system of units are used.

GENERAL HYDROLOGIC CONDITIONS FOR 1986

COLORADO RIVER

Normally, there is no measurable amount of runoff from the portion of the Colorado River basin in the United States and Mexico below Hoover Dam, not including Bill Williams and Gila Rivers. There was no significant amount in 1986. In the lower basin of the Colorado River in Mexico, from Morelos Diversion Dam to the Gulf of California, the average precipitation during 1986 measured at 5 index stations was 1.34 inches, compared to an average of 2.83 inches during the last 28 years (1959 to 1986).

The flow of the Colorado River reaching Imperial Dam was 14,703,000 acre-feet, about 173% of the 52-year average (1935-1986) of 8,518,238 acre-feet. At the northerly international boundary, the total flow of the river during 1986 was 10,687,874 acre-feet, about 255% of the 1935-1986 average of 4,188,062 acre-feet. At the southerly international boundary, the flow during 1986 was 8,263,360 acre-feet, or about 268% of the 1935-1986 average of 3,083,590 acre-feet.

The total of all flows of the Colorado River entering Mexico in 1986 amounted to 10,923,781 acre-feet, 231% of the 1935-1986 average of 4,721,167 acre-feet, as measured 1) in the Colorado River at the northerly international boundary, 2) in the Wellton-Mohawk Main Outlet Drain Extension near Morelos Dam, 3) in the wasteways that discharge into the limitrophe section of the river from the United States bank, 4) in the canal which discharges waste and drainage waters from the Yuma Project across the southerly land boundary into Mexico near San Luis, Arizona, 5) in the Wellton-Mohawk Bypass Drain at the southerly land boundary near San Luis, Arizona, and 6) the 242 Well Field near San Luis, Arizona.

During 1986, other waters arrived at the Mexican points of diversion and amounted to 10,813,729 acre-feet. These waters consisted mainly of excess waters released from reservoirs on the Colorado River. A maximum instantaneous flow of 24,800 second-feet occurred in the Colorado River at the northerly boundary station on June 1.

Stored waters at the end of the year in the three major reservoirs on the Colorado River below Lee's Ferry amounted to 26,573,000 acre-feet, 93% of the usable capacity of 28,588,400 acre-feet. The greater part (24,456,000 acre-feet) of the storage was contained in Lake Mead (Hoover Dam). There were no reported shortages of Colorado River water for irrigation during 1986 due to drought or accident to the irrigation system.

The total reported acreage irrigated from waters of the Colorado River below Imperial Dam in 1986 was 1,198,476 acres; 679,862 acres in the United States and 518,614 acres in Mexico. An estimated 33% of acreage in Mexico is served by pumping from ground water.

The suspended sediment load passing the northerly boundary station in 1986 was 2,501.7 acre-feet, about 376% of the 1956-1986 average of 665 acre-feet.

TIJUANA RIVER BASIN

During 1986, the temperatures at Barrett Dam, California (elevation 1,750 feet) in the upper portion of the basin in the United States averaged 62.4 degrees, 1.0 degree above the 55-year mean. In the extreme upper portion of the basin in Mexico at El Pinal, Baja California (elevation 4,429 feet), the recorded temperatures during the year averaged 54 degrees, 2 degrees above the long-term average; and at Rodriguez Dam, Baja California (elevation 459 feet), the recorded temperatures averaged 66 degrees, 2 degrees above the normal for many years.

At Barrett Dam in the upper portion of the basin in the United States, the recorded precipitation was 15.63 inches, 88% of normal; and at Chula Vista near the lower end of the basin, 13.04 inches, or 132% of normal. The recorded precipitation at El Pinal in the upper portion of the basin in Mexico, was 15.12 inches, approximately 74% of the normal during the 23-year period; and at Rodriguez Dam in the lower portion of the basin in Mexico, 9.33 inches, 106% of the 49-year average.

Runoff above Barrett and Rodriguez Reservoirs during 1986 averaged more than 49% of normal. Above Morena Reservoir the runoff was 7,047 acre-feet, or about 65% of the 50-year 1937-1986 mean of 10,887 acre-feet. Above Barrett Reservoir the runoff was 10,253 acre-feet, or about 81% of the 50-year 1937-1986 mean of 12,617 acre-feet. At Rodriguez Reservoir, the runoff was 7,806 acre-feet, or about 32% of the 49-year mean of 24,532 acre-feet.

The flow of the Tijuana River at the international boundary was 14,478 acre-feet during 1986.

WHITEWATER DRAW

During 1986, the average annual temperature over the watershed was 0.1 degree above normal, while the annual precipitation was 143% of normal. Runoff for the year at the gaging station near Douglas, Arizona, of 9,892 acre-feet, was about 157% of average.

GENERAL HYDROLOGIC CONDITIONS FOR 1986

SAN PEDRO RIVER

During 1986, the average annual temperature was 0.1 degree below normal. The annual precipitation, as measured at Coronado National Monument Headquarters, was 118% of the 1961-1986 mean of 21.06 inches. The stream flow at the international boundary was 15,502 acre-feet, 66% of the 1951-1986 normal.

SANTA CRUZ RIVER

During 1986, the average annual temperature over the watershed was somewhat above normal, and the annual precipitation was about 124% of the 48-year 1939-1986 mean. Runoff measured at the Nogales gaging station, where the stream re-enters the United States, was 16,687 acre-feet. The total runoff for the year measured at the gaging station near Lochiel, Arizona, where the stream enters Mexico from the United States, was 2,589 acre-feet. Therefore, neglecting stream flow depletions in Mexico, the records indicate a contribution of about 14,098 acre-feet from the loop of the river lying in Mexico, or approximately 84% of the flow reaching the Nogales station.

ALAMO AND NEW RIVERS

During 1986, the average annual temperature over the drainage areas of the Alamo and New Rivers, as recorded at El Centro, California, was 74.0 degrees, 1.8 degree above normal; and over the drainage area of the New River, as recorded at Mexicali, Baja California, it was 73 degrees, 4 degrees above the 61-year average.

At El Centro, the precipitation was 3.91 inches, about 143% of the 56-year average; and in Mexicali, the annual precipitation was 3.35 inches, 105% of the 61-year average. The total flow of the New River at the international boundary in 1986 was 264,833 acre-feet, which was about 256% of the 1943-1986 average.

SALTON SEA

During 1986, the average annual temperature around the Salton Sea was 0.5 degree above the long-term average, while the annual precipitation recorded at Brawley, California was approximately 134% of the long-term mean of 2.72 inches. The water surface of the Salton Sea remained more or less the same during the year. The maximum stage, 226.9 feet below mean sea level, was recorded on April 2 through May 6, 1986, inclusive. The minimum stage, 228.1 feet below mean sea level, was recorded on September 30 through October 9, 1986, inclusive.

RESERVATION MAIN DRAIN NO. 4 (CALIFORNIA DRAIN)

DESCRIPTION: Water-stage recorder (digital) located 500 feet (152 m) upstream from railroad culvert and one mile (1.6 km) northwest of Yuma, Arizona. Discharge measurements are made from a footbridge immediately below the gage. The drainage canal discharges into the outfall channel of the Yuma Main Canal Wasteway 200 feet (61.0 m) downstream from the spillway structure, and thence into the Colorado River on the right bank, 1,000 feet (305 m) upstream from Colorado River below Yuma Main Canal Wasteway, and 6.5 miles (10.5 km) upstream from the northerly international boundary. Prior to October 1955, published as "California Drainage Canal near Yuma, Arizona."

RECORDS: Based on current meter measurements and a continuous record of gage heights. Records are computed and furnished by the U. S. Geological Survey. Records available: Monthly discharge, January 1913 to April 1920, October 1921 to March 1925, and January 1934 to September 1947; daily and monthly discharge, October 1947 through 1986.

REMARKS: Reservation Main Drain No. 4 collects drainage and wastewater from the area east of the Yuma Main Canal on the Reservation Division of the Yuma Project, located in California. Since 1939, collection of seepage from the All-American Canal has caused large increases in drainage flows. Average annual flow prior to 1937 was 12,800 acre-feet (15,789,000 m³). Monthly and annual averages since 1937 are shown in the table below.

EXTREMES: Prior to 1937: Maximum annual flow 20,190 acre-feet (24,904,000 m³), 1916; minimum annual flow 8,920 acre-feet (11,003,000 m³), 1913.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	68.0	69.0	68.0	83.0	93.0	74.0	76.0	83.0	89.0	94.0	89.0	78.0
2	68.0	69.0	68.0	94.0	90.0	75.0	79.0	83.0	87.0	87.0	89.0	78.0
3	69.0	70.0	77.0	88.0	92.0	75.0	79.0	88.0	82.0	89.0	88.0	78.0
4	68.0	71.0	80.0	83.0	97.0	75.0	77.0	88.0	84.0	84.0	88.0	78.0
5	66.0	71.0	75.0	79.0	87.0	75.0	81.0	84.0	80.0	90.0	88.0	77.0
6	69.0	69.0	86.0	88.0	89.0	75.0	79.0	83.0	72.0	97.0	88.0	77.0
7	68.0	69.0	79.0	85.0	84.0	76.0	78.0	91.0	77.0	90.0	88.0	77.0
8	67.0	69.0	80.0	84.0	75.0	76.0	76.0	91.0	71.0	90.0	87.0	76.0
9	69.0	70.0	91.0	95.0	74.0	76.0	82.0	91.0	62.0	90.0	87.0	76.0
10	68.0	69.0	87.0	87.0	74.0	76.0	76.0	91.0	62.0	90.0	86.0	76.0
11	68.0	65.0	80.0	92.0	74.0	76.0	75.0	90.0	61.0	90.0	86.0	75.0
12	67.0	66.0	88.0	98.0	74.0	77.0	77.0	88.0	65.0	90.0	86.0	75.0
13	66.0	68.0	80.0	103	74.0	77.0	79.0	88.0	66.0	90.0	85.0	75.0
14	64.0	72.0	78.0	92.0	74.0	77.0	81.0	83.0	77.0	91.0	85.0	74.0
15	69.0	72.0	85.0	81.0	74.0	77.0	76.0	88.0	72.0	85.0	84.0	74.0
16	67.0	69.0	92.0	91.0	74.0	77.0	86.0	88.0	69.0	81.0	84.0	74.0
17	68.0	70.0	94.0	82.0	74.0	77.0	82.0	89.0	72.0	86.0	84.0	73.0
18	63.0	66.0	97.0	72.0	74.0	78.0	84.0	88.0	73.0	83.0	83.0	73.0
19	64.0	67.0	97.0	78.0	74.0	78.0	80.0	88.0	75.0	89.0	83.0	73.0
20	67.0	68.0	95.0	86.0	74.0	78.0	80.0	88.0	72.0	86.0	82.0	72.0
21	67.0	72.0	81.0	87.0	74.0	78.0	80.0	88.0	82.0	85.0	82.0	72.0
22	67.0	72.0	90.0	87.0	74.0	78.0	83.0	88.0	77.0	85.0	82.0	72.0
23	67.0	70.0	94.0	97.0	74.0	79.0	83.0	88.0	82.0	84.0	81.0	72.0
24	66.0	73.0	93.0	96.0	74.0	79.0	79.0	88.0	82.0	84.0	81.0	71.0
25	62.0	72.0	89.0	79.0	74.0	79.0	80.0	88.0	88.0	88.0	80.0	71.0
26	62.0	70.0	89.0	83.0	74.0	79.0	80.0	88.0	85.0	91.0	80.0	70.0
27	58.0	65.0	91.0	92.0	74.0	79.0	84.0	88.0	91.0	84.0	80.0	70.0
28	58.0	60.0	84.0	96.0	74.0	80.0	84.0	88.0	88.0	88.0	79.0	70.0
29	62.0		83.0	85.0	74.0	80.0	83.0	88.0	91.0	94.0	79.0	70.0
30	59.0		94.0	91.0	74.0	80.0	82.0	88.0	90.0	90.0	78.0	70.0
31	62.0		82.0		74.0		82.0	88.0		93.0		69.0
Sum	2,033.0	1,933.0	2,647.0	2,634.0	2,409.0	2,316.0	2,483.0	2,724.0	2,324.0	2,738.0	2,522.0	2,286.0
Current Year 1986										Period 1937-1986		
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			1 3	69.0	127	58.0	65.6	4,032	3,189	4,780		877
Feb.			24	73.0	28	60.0	69.0	3,834	2,992	4,320		563
Mar.			118	97.0	1	68.0	85.4	5,250	3,713	5,250	1,240	
Apr.			13	103	18	72.0	87.8	5,224	3,721	5,250		1,160
May			4	97.0	9	74.0	77.7	4,778	3,813	5,590		992
June			128	80.0	1	74.0	77.2	4,594	3,690	5,580		885
July			16	86.0	11	75.0	80.1	4,925	3,945	6,550		816
Aug.			7	91.0	1	83.0	87.9	5,403	3,952	6,810		861
Sept.			127	91.0	11	61.0	77.5	4,610	3,743	6,220		889
Oct.			6	97.0	16	81.0	88.3	5,431	3,812	5,740	1,040	
Nov.			1	89.0	30	78.0	84.1	5,002	3,533	5,490		994
Dec.			1	78.0	31	69.0	73.7	4,534	3,404	4,960		966
Yearly				103		58.0	79.6	57,617	43,507	63,700	12,840	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				2.92		1.64	2.25	71,069	53,665	78,573	15,838	

0 Mean daily

1 And other days

YUMA MAIN CANAL WASTEWAY TO COLORADO RIVER AT YUMA, ARIZONA

DESCRIPTION: The wasteway receives water from the Yuma Main Canal at the check structure on the canal, 1,645 feet (501 m) upstream from the intake of the Colorado River siphon, and 3.2 miles (5.1 km) downstream from the Siphon Drop Power Plant. This wasteway discharges into the Colorado River on the California side, 1,000 feet (305 m) upstream from Colorado River below Yuma Main Canal Wasteway, and 6.5 miles (10.5 km) upstream from the northerly international land boundary.

RECORDS: Discharge is computed as the difference between the measured discharge of the Yuma Main Canal at the Siphon Drop Power Plant upstream and that of the same canal below the Colorado River siphon, with deductions for small irrigation diversions from the canal between the two gaging stations. Records obtained and furnished by U. S. Geological Survey. Records available: April 1913 through 1986.

REMARKS: The wasteway discharges to the river the flow in excess of irrigation water in the Yuma Main Canal.

EXTREMES: Prior to 1935, when storage began in Lake Mead: Average annual flow, 297,800 acre-feet (367,333,000 m³); maximum annual flow, 913,700 acre-feet (1,127,040,000 m³), 1932; minimum annual flow, 114,900 acre-feet (141,728,000 m³), 1917. Since 1935: Maximum mean daily discharge, 2,020 second-feet (57.2 m³/sec), December 24-25, 1948; minimum mean daily discharge, no flow on numerous occasions.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.0	14.0	12.0	13.0	10.0	18.0	16.0	12.0	13.0	13.0	11.0	10.0
2	15.0	20.0	11.0	12.0	10.0	14.0	20.0	12.0	22.0	14.0	9.9	10.0
3	14.0	12.0	13.0	12.0	10.0	10.0	32.0	11.0	16.0	21.0	7.7	10.0
4	12.0	22.0	11.0	12.0	9.7	11.0	33.0	11.0	13.0	22.0	14.0	12.0
5	13.0	20.0	11.0	12.0	9.2	15.0	18.0	15.0	16.0	19.0	14.0	15.0
6	13.0	12.0	11.0	13.0	11.0	16.0	14.0	20.0	25.0	15.0	13.0	15.0
7	12.0	15.0	11.0	17.0	10.0	13.0	13.0	46.0	19.0	12.0	13.0	12.0
8	11.0	12.0	11.0	13.0	8.7	23.0	13.0	27.0	24.0	13.0	13.0	11.0
9	10.0	13.0	13.0	13.0	7.1	12.0	13.0	20.0	23.0	8.3	13.0	11.0
10	11.0	12.0	11.0	12.0	7.3	12.0	13.0	10.0	22.0	8.4	12.0	11.0
11	11.0	12.0	14.0	12.0	7.7	12.0	14.0	10.0	30.0	8.5	11.0	15.0
12	11.0	12.0	12.0	12.0	7.7	11.0	22.0	10.0	21.0	8.2	11.0	13.0
13	11.0	12.0	11.0	11.0	9.6	14.0	19.0	13.0	12.0	7.7	11.0	12.0
14	11.0	12.0	11.0	11.0	9.9	16.0	15.0	17.0	11.0	7.7	12.0	11.0
15	16.0	16.0	11.0	11.0	7.7	21.0	20.0	33.0	16.0	7.7	11.0	11.0
16	16.0	21.0	14.0	11.0	7.7	19.0	23.0	18.0	23.0	7.3	12.0	15.0
17	12.0	21.0	14.0	11.0	8.7	19.0	12.0	16.0	11.0	13.0	12.0	11.0
18	15.0	14.0	12.0	11.0	11.9	22.0	15.0	16.0	11.0	7.7	12.0	11.0
19	12.0	12.0	11.0	10.0	3.9	15.0	17.0	18.0	11.0	7.8	13.0	11.0
20	12.0	12.0	14.0	10.0	3.4	19.0	19.0	20.0	11.0	9.2	14.0	11.0
21	12.0	11.0	13.0	12.0	3.2	25.0	23.0	17.0	11.0	13.0	12.0	11.0
22	12.0	11.0	13.0	11.0	2.7	30.0	15.0	15.0	13.0	8.5	18.0	10.0
23	12.0	11.0	13.0	11.0	4.1	17.0	12.0	15.0	14.0	7.8	13.0	11.0
24	12.0	13.0	13.0	11.0	5.3	14.0	18.0	14.0	11.0	7.7	13.0	11.0
25	23.0	11.0	13.0	11.0	5.1	14.0	12.0	14.0	13.0	7.7	13.0	15.0
26	13.0	11.0	13.0	11.0	5.9	14.0	12.0	13.0	11.0	7.7	11.0	11.0
27	15.0	11.0	12.0	11.0	7.7	16.0	12.0	24.0	13.0	10.0	11.0	11.0
28	13.0	11.0	12.0	11.0	8.0	33.0	12.0	29.0	15.0	8.9	10.0	11.0
29	13.0		12.0	11.0	14.0	20.0	12.0	21.0	10.0	9.0	10.0	11.0
30	13.0		12.0	10.0	15.0	23.0	15.0	13.0	11.0	11.0	10.0	11.0
31	14.0		13.0		13.0		12.0	18.0		7.8		11.0
Sum	402.0	386.0	378.0	349.0	362.3	518.0	516.0	548.0	472.0	329.6	360.6	362.0
Current Year 1986												
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1935-1986			
	High	Low	Day	High	Day	Low			Acre-Feet			
Jan.			25	23.0	9	10.0	13.0	797	46,530	110,700	446	
Feb.			4	22.0	121	11.0	13.8	766	40,834	89,140	360	
Mar.			111	14.0	12	11.0	12.2	750	40,379	90,190	357	
Apr.			7	17.0	119	10.0	11.6	692	40,841	86,580	326	
May			18	11.9	22	2.7	11.7	719	48,893	88,280	333	
June			28	33.0	3	10.0	17.3	1,027	42,758	86,960	342	
July			4	33.0	117	12.0	16.6	1,023	39,961	91,220	369	
Aug.			7	46.0	110	10.0	17.7	1,087	40,519	89,890	369	
Sept.			11	30.0	29	10.0	15.7	936	44,367	83,660	357	
Oct.			4	22.0	16	7.3	10.6	654	41,097	90,050	567	
Nov.			22	18.0	3	7.7	12.0	715	41,180	101,500	715	
Dec.			15	15.0	11	10.0	11.7	718	45,227	108,800	462	
Yearly				119		2.7	13.7	9,884	512,546	1,042,850	6,669	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				3.37		0.08	0.39	12,192	632,215	1,286,345	8,226	

0 Mean daily

! And other days

COLORADO RIVER BELOW YUMA MAIN CANAL WASTEWAY
AT YUMA, ARIZONA - DISCHARGES

DESCRIPTION: Water-stage recorder located in California on the right bank of the river, 1,000 feet (305 m) downstream from the mouth of the Yuma Main Canal Wasteway, 0.6 mile (1.0 km) downstream from the abandoned gaging station on the Colorado River at Yuma, 5.2 miles (8.4 km) downstream from the mouth of the Gila River, 19.6 miles (31.5 km) downstream from Imperial Dam, and 6.4 miles (10.3 km) upstream from the northerly international boundary. Zero of the gage is 101.99 feet (31.09 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on current meter measurements and a continuous record of gage heights. Computations by shifting control methods. Records obtained and furnished by U. S. Geological Survey. Records available: October 1963 through 1986. Records from January 1951 through September 1963 deduced from "Colorado River at Yuma" plus flows from "Reservation Main Drain No. 4" and "Yuma Main Canal Wasteway."

REMARKS: Reservoirs on the Colorado River, power developments, transmountain diversions, reservoirs on the Gila River, irrigation diversions, and return flows modify the river flow at this station.

Mean Daily Discharge in Second-Foot 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	9,020	11,600	5,270	8,480	6,180	18,400	10,400	8,280	7,400	7,410	2,970	4,150
2	8,240	11,200	5,720	8,750	6,220	17,900	10,700	7,730	7,630	7,290	3,040	3,760
3	7,870	10,100	6,320	8,410	6,480	18,000	10,800	8,240	6,860	7,230	2,930	3,870
4	8,570	8,370	6,390	8,500	6,670	18,400	10,100	8,260	7,000	7,060	3,500	3,710
5	9,110	5,480	6,650	8,520	6,170	17,200	10,600	7,790	6,730	7,230	4,790	3,560
6	9,050	2,870	6,670	8,850	6,260	17,100	10,600	7,680	6,090	7,100	5,390	3,450
7	9,730	1,930	6,230	8,530	6,500	16,800	9,240	7,730	6,770	6,680	5,070	4,180
8	9,310	2,550	7,140	8,310	6,750	15,700	9,000	7,330	6,270	6,370	5,840	3,600
9	9,300	6,030	7,640	8,420	7,760	13,300	9,000	7,600	5,800	4,890	6,790	3,260
10	9,280	7,020	6,370	8,160	10,100	11,600	8,620	7,950	5,560	5,200	6,280	3,800
11	9,330	7,320	6,080	8,310	11,200	11,500	8,280	8,080	5,480	5,550	5,530	3,510
12	10,400	7,980	6,790	7,320	11,300	10,800	8,000	7,930	5,730	5,550	5,600	3,840
13	11,700	8,550	7,080	6,940	11,000	10,600	8,640	8,090	5,820	4,660	5,820	4,150
14	11,500	8,770	8,350	5,910	11,600	10,800	8,440	8,140	6,480	4,010	6,230	5,160
15	11,300	8,910	9,520	5,680	12,800	11,300	8,090	8,340	6,190	3,720	6,700	5,490
16	11,000	9,670	10,100	6,010	14,400	10,700	8,590	8,290	6,170	3,590	7,270	7,400
17	10,200	9,640	9,620	5,840	15,400	10,400	8,300	8,770	6,400	3,870	6,890	8,230
18	9,170	9,470	9,160	5,630	16,500	10,300	8,330	8,180	6,390	3,790	7,840	8,100
19	9,700	9,420	8,820	5,810	15,900	9,980	8,260	8,190	6,530	3,910	8,050	7,800
20	10,500	9,350	8,590	6,020	15,600	10,300	8,370	7,960	6,460	3,130	7,450	8,750
21	11,100	9,120	8,640	5,960	15,300	10,600	8,220	7,850	6,630	2,720	7,370	10,200
22	11,500	9,050	9,350	5,890	15,500	10,900	8,390	8,040	6,500	2,860	8,010	10,600
23	11,600	9,210	9,400	6,080	16,400	10,000	10,700	7,360	6,810	2,790	8,290	11,300
24	11,900	8,110	8,530	5,830	16,500	10,100	9,210	6,920	7,390	2,880	7,310	12,600
25	11,600	6,210	8,130	5,620	17,000	10,100	9,450	6,300	7,900	3,010	7,180	13,000
26	11,600	5,440	8,480	6,080	17,200	10,000	9,100	6,180	7,940	2,940	7,160	12,400
27	11,000	4,820	8,640	6,140	17,100	10,200	9,400	6,150	8,080	3,200	7,520	12,400
28	10,900	4,570	8,410	6,230	18,000	10,100	8,840	6,750	8,520	3,050	6,680	12,600
29	11,300		8,890	6,010	18,100	10,700	8,550	7,170	7,890	3,190	5,700	11,800
30	11,200		9,540	6,170	17,900	10,900	8,550	7,150	7,630	2,990	5,090	11,100
31	11,100		8,700		17,200		8,550	7,630		2,860		11,300
Sum	319,080	212,760	245,220	208,410	390,990	374,680	281,320	238,060	203,050	140,730	184,290	229,070
Current Year 1986												
Period 1951-1986												
Month	Extreme Gage Feet		Day	Extreme Second-Foot		Average Second-Foot	Total Acre-Feet	Acre-Feet				
	High	Low		High	Low			Average	Maximum	Minimum		
Jan.	116.23	114.94	24	11,900	3	7,870	10,300	632,886	244,022	1,068,099	29,857	
Feb.	116.56	110.56	1	11,600	7	1,930	7,600	422,003	191,113	995,901	33,790	
Mar.	115.87	113.56	16	10,100	1	5,270	7,910	486,387	197,876	1,073,270	34,604	
Apr.	115.35	113.88	6	8,850	25	5,620	6,950	413,375	184,736	843,010	33,687	
May	118.29	114.13	29	18,100	5	6,170	12,600	775,517	196,500	863,860	45,872	
June	118.64	116.25	1	18,400	19	9,980	12,500	743,167	201,019	902,876	33,856	
July	116.53	115.17	3	10,800	12	8,000	9,080	557,990	233,902	1,632,595	34,413	
Aug.	115.42	114.19	17	8,770	27	6,150	7,680	472,185	237,751	1,681,388	33,610	
Sept.	115.55	113.42	128	9,030	11	5,110	6,770	402,744	208,273	1,353,719	43,182	
Oct.	114.98	110.60	5	7,690	120	2,390	4,540	279,134	178,244	1,451,107	34,965	
Nov.	114.85	110.74	23	8,640	4	2,620	6,140	365,534	181,970	1,047,471	34,832	
Dec.	116.29	111.71	124	13,300	1	8,130	7,390	458,354	213,342	1,114,550	33,023	
Yearly	118.64	110.56		18,400		1,930	8,290	6,005,276	2,468,748	10,592,467	513,755	
	Meters		Cubic Meters per Second					Thousands of Cubic Meters				
	36.16	33.70		521		54.7	235	7,407,388	3,045,151	13,065,596	633,712	

0 Extreme gage height and extreme second feet are mean daily extremes for the period January through August.

! And other days

COLORADO RIVER BELOW YUMA MAIN CANAL WASTEWAY
AT YUMA, ARIZONA - STAGES

(See Preceding Page for Description)

MEAN DAILY GAGE HEIGHT IN FEET 1986

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	115.64	116.55	113.56	115.18	114.17	118.52	116.41	114.78	114.83	114.83	111.33	112.91
2	115.32	116.56	113.80	115.30	114.19	118.44	116.52	114.63	114.90	114.77	111.41	112.53
3	115.13	116.32	114.14	115.15	114.33	118.52	116.53	114.89	114.50	114.74	111.23	112.67
4	115.39	115.70	114.18	115.19	114.42	118.64	116.26	114.92	114.56	114.66	111.93	112.47
5	115.56	114.42	114.32	115.20	114.41	118.40	116.48	114.73	114.40	114.76	113.35	112.28
6	115.48	111.92	114.33	115.35	114.15	118.40	116.46	114.70	114.04	114.70	113.71	112.14
7	115.70	110.56	114.09	115.20	114.13	118.38	115.92	114.68	114.40	114.49	113.49	113.03
8	115.46	111.45	114.57	115.10	114.31	118.10	115.82	114.60	114.11	114.33	113.88	112.32
9	115.40	114.75	114.82	115.15	114.76	117.40	115.82	114.76	113.83	113.49	114.36	111.89
10	115.34	115.09	114.17	115.03	115.73	116.86	115.65	114.94	113.68	113.68	114.04	112.58
11	115.29	115.05	114.01	115.12	116.12	116.87	115.50	115.03	113.62	113.88	113.58	112.23
12	115.65	115.19	114.39	114.68	116.09	116.68	115.37	114.98	113.76	113.89	113.57	112.63
13	116.10	115.25	114.54	114.52	115.93	116.62	115.66	115.08	113.82	113.34	113.66	113.00
14	115.95	115.35	115.14	114.00	116.16	116.73	115.57	115.12	114.20	112.68	113.85	113.83
15	115.84	115.41	115.65	113.90	116.61	116.90	115.41	115.21	114.04	112.35	114.06	113.87
16	115.64	115.73	115.87	114.13	117.13	116.67	115.64	115.20	114.05	112.22	114.31	114.59
17	115.32	115.72	115.69	114.05	117.44	116.55	115.51	115.42	114.18	112.59	114.07	114.69
18	114.94	115.65	115.50	113.92	117.75	116.51	115.52	115.16	114.19	112.53	114.50	114.34
19	115.20	115.63	115.35	114.02	117.58	116.39	115.49	115.17	114.27	112.70	114.58	114.05
20	115.55	115.60	115.25	114.14	117.48	116.53	115.54	115.07	114.24	111.67	114.30	114.49
21	115.81	115.50	115.27	114.10	117.41	116.59	115.47	115.02	114.34	111.13	114.26	115.11
22	116.01	115.47	115.58	114.05	117.47	116.69	115.55	115.12	114.28	111.38	114.56	115.29
23	116.06	115.54	115.60	114.16	117.74	116.30	116.49	114.79	114.45	111.26	114.69	115.56
24	116.23	115.05	115.21	114.01	117.78	116.27	115.91	114.58	114.75	111.38	114.23	116.05
25	116.14	114.09	115.03	113.88	117.95	116.26	116.01	114.26	115.01	111.54	114.16	116.19
26	116.20	113.65	115.19	114.14	118.00	116.25	115.86	114.20	115.04	111.43	114.15	115.98
27	116.00	113.31	115.25	114.17	117.99	116.32	115.99	114.19	115.11	111.77	114.33	116.00
28	116.02	113.15	115.15	114.22	118.25	116.28	115.74	114.51	115.32	111.54	114.00	116.08
29	116.19		115.36	114.09	118.27	116.50	115.57	114.73	115.03	111.71	113.65	115.82
30	116.20		115.64	114.17	118.29	116.58	115.37	114.72	114.91	111.40	113.51	115.56
31	116.21		115.28		118.14		115.17	114.95		111.20		115.67
Avg.	115.71	114.77	114.90	114.51	116.45	117.07	115.84	114.84	114.40	112.84	113.69	114.06

YUMA MESA OUTLET DRAIN
TO COLORADO RIVER NEAR YUMA, ARIZONA

DESCRIPTION: Venturi meter with recorder 0.3 mile (0.5 km) from outlet to Colorado River, 0.5 mile (0.8 km) west of Joe Henry Memorial Park in Yuma, Arizona. Outlet is 1.7 miles (2.7 km) downstream from the mouth of Yuma Main Canal Wasteway.

RECORDS: Records are furnished by U. S. Geological Survey. Monthly discharge July 1970 through 1986. Prior to July 21, 1972, records furnished by U. S. Bureau of Reclamation.

REMARKS: Records show water pumped from wells on the Yuma Mesa and conveyed by underground conduit to Colorado River.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	31.0	28.0	28.0	42.0	46.0	49.0	38.0	0	42.0	29.0	29.0	25.0
2	31.0	28.0	28.0	44.0	51.0	49.0	45.0	0	42.0	29.0	29.0	28.0
3	31.0	28.0	28.0	44.0	51.0	49.0	45.0	0	42.0	29.0	29.0	28.0
4	31.0	28.0	28.0	44.0	51.0	49.0	45.0	0	42.0	29.0	29.0	28.0
5	31.0	28.0	28.0	44.0	51.0	49.0	45.0	0	42.0	29.0	29.0	28.0
6	31.0	28.0	28.0	44.0	51.0	19.0	43.0	0	42.0	29.0	29.0	28.0
7	31.0	28.0	28.0	31.0	51.0	0	42.0	0	42.0	30.0	29.0	21.0
8	31.0	28.0	28.0	0	51.0	0	42.0	0	42.0	34.0	29.0	31.0
9	31.0	28.0	28.0	0	51.0	0	42.0	0	42.0	34.0	29.0	28.0
10	31.0	28.0	21.0	17.0	51.0	0	42.0	0	42.0	34.0	29.0	28.0
11	31.0	28.0	24.0	44.0	51.0	0	42.0	29.0	42.0	32.0	29.0	28.0
12	31.0	28.0	28.0	44.0	51.0	0	42.0	40.0	42.0	29.0	29.0	28.0
13	31.0	28.0	28.0	44.0	51.0	0	42.0	36.0	42.0	27.0	29.0	28.0
14	31.0	28.0	28.0	44.0	51.0	0	42.0	41.0	42.0	27.0	29.0	28.0
15	26.0	28.0	28.0	44.0	51.0	0	42.0	43.0	42.0	30.0	29.0	28.0
16	23.0	28.0	28.0	44.0	51.0	10.0	43.0	43.0	42.0	34.0	29.0	28.0
17	28.0	28.0	28.0	44.0	51.0	19.0	45.0	43.0	42.0	31.0	29.0	28.0
18	31.0	28.0	28.0	44.0	51.0	17.0	45.0	43.0	40.0	29.0	29.0	28.0
19	31.0	28.0	28.0	44.0	51.0	19.0	45.0	43.0	35.0	29.0	29.0	28.0
20	31.0	28.0	28.0	44.0	51.0	14.0	37.0	43.0	33.0	29.0	29.0	28.0
21	13.0	28.0	28.0	44.0	51.0	14.0	45.0	43.0	33.0	29.0	29.0	28.0
22	0	28.0	28.0	44.0	51.0	18.0	18.0	43.0	33.0	29.0	29.0	28.0
23	0	28.0	28.0	44.0	51.0	19.0	0	43.0	33.0	29.0	29.0	28.0
24	0	28.0	11.0	44.0	51.0	18.0	0	43.0	33.0	29.0	29.0	28.0
25	0	28.0	0	44.0	51.0	22.0	0	43.0	33.0	29.0	29.0	28.0
26	0	28.0	30.0	44.0	51.0	24.0	0	43.0	33.0	29.0	29.0	28.0
27	4.0	28.0	44.0	44.0	51.0	26.0	0	43.0	33.0	29.0	29.0	28.0
28	19.0	28.0	43.0	44.0	51.0	27.0	0	43.0	33.0	29.0	29.0	28.0
29	31.0	43.0	44.0	44.0	51.0	27.0	0	43.0	29.0	29.0	25.0	28.0
30	31.0	43.0	44.0	44.0	51.0	26.0	0	43.0	28.0	29.0	23.0	28.0
31	28.0		43.0		51.0		0	43.0		29.0		28.0
Sum	730.0	784.0	890.0	1,190.0	1,576.0	564.0	917.0	877.0	1,143.0	922.0	860.0	861.0
Current Year 1986									Period 1971-1986			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			1	31.0	122	0	23.5	1,448	2,473	5,840	0	
Feb.			1	28.0	1	28.0	28.0	1,555	2,361	4,830	0	
Mar.			27	44.0	25	0	28.7	1,765	2,737	5,430	4.0	
Apr.			12	44.0	18	0	39.7	2,360	2,591	5,120	242	
May			12	51.0	1	46.0	50.8	3,126	2,533	4,933	0	
June			1	49.0	17	0	18.8	1,119	2,306	4,828	0	
July			12	45.0	123	0	29.6	1,819	2,616	5,510	692	
Aug.			115	43.0	1	0	28.3	1,740	2,851	6,000	180	
Sept.			1	42.0	30	28.0	38.1	2,267	2,895	5,880	0	
Oct.			18	34.0	113	27.0	29.7	1,829	2,816	5,360	157	
Nov.			1	29.0	30	23.0	28.7	1,706	2,870	5,290	313	
Dec.			8	31.0	7	21.0	27.8	1,708	3,006	5,970	0	
				51.0		0	31.0	22,442	32,055	58,680	1,753	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				1.44		0	.88	27,682	39,539	72,381	2,162	

0 Mean daily

1 And other days

DRAIN NO. 8-B (ARAZ DRAIN)

DESCRIPTION: This drain discharges into the Colorado River 4.0 miles (6.4 km) downstream from Colorado River below Yuma Main Canal Wasteway, and 2.5 miles (4.0 km) upstream from the northerly international boundary. Prior to October 1955, published as "Araz Drain."

RECORDS: Records are furnished by the U. S. Geological Survey from current meter measurements during the year. Records available: May 1948 through 1986.

REMARKS: Drain 8-B, which was constructed in February 1948, collects seepage water in the westerly section of the Reservation Division of the Yuma Project which lies in California. Flow in the drain between the mouth and the U. S. Highway No. 80 culvert, about 3,200 feet (975 m) upstream, is affected by backwater from the river during ordinary high stages.

EXTREMES: Mean daily discharge: Maximum, 24 second-feet (0.68 m³/sec) on September 1, 1953; minimum, 0.1 second-foot (0.003 m³/sec) several days in February 1966.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.0	12.0	12.0	13.0	14.0	16.0	16.0	19.0	17.0	19.0	17.0	16.0
2	12.0	12.0	12.0	13.0	14.0	16.0	17.0	19.0	18.0	19.0	17.0	16.0
3	12.0	12.0	13.0	13.0	14.0	16.0	17.0	18.0	18.0	19.0	17.0	16.0
4	12.0	12.0	13.0	13.0	14.0	16.0	17.0	18.0	19.0	19.0	17.0	16.0
5	12.0	12.0	13.0	14.0	14.0	16.0	17.0	17.0	19.0	19.0	16.0	16.0
6	11.0	12.0	13.0	15.0	14.0	16.0	17.0	17.0	19.0	19.0	16.0	16.0
7	11.0	12.0	13.0	15.0	14.0	16.0	17.0	16.0	19.0	19.0	16.0	16.0
8	11.0	12.0	13.0	15.0	14.0	16.0	17.0	16.0	19.0	19.0	16.0	15.0
9	11.0	12.0	13.0	15.0	14.0	16.0	17.0	16.0	19.0	19.0	16.0	15.0
10	11.0	12.0	13.0	15.0	14.0	16.0	17.0	16.0	19.0	20.0	15.0	15.0
11	11.0	12.0	13.0	15.0	14.0	16.0	17.0	16.0	19.0	20.0	15.0	15.0
12	11.0	12.0	13.0	15.0	14.0	16.0	17.0	16.0	19.0	20.0	15.0	15.0
13	11.0	12.0	13.0	15.0	15.0	16.0	17.0	16.0	19.0	20.0	15.0	15.0
14	12.0	12.0	13.0	14.0	15.0	16.0	17.0	16.0	19.0	20.0	15.0	15.0
15	12.0	12.0	13.0	14.0	15.0	16.0	17.0	16.0	19.0	20.0	15.0	15.0
16	12.0	12.0	13.0	14.0	15.0	16.0	17.0	16.0	19.0	20.0	15.0	15.0
17	12.0	12.0	13.0	14.0	15.0	16.0	17.0	16.0	19.0	20.0	16.0	15.0
18	12.0	12.0	13.0	14.0	15.0	15.0	17.0	16.0	19.0	20.0	16.0	14.0
19	12.0	12.0	13.0	14.0	15.0	15.0	17.0	16.0	19.0	20.0	16.0	14.0
20	12.0	12.0	13.0	14.0	15.0	15.0	17.0	16.0	19.0	20.0	16.0	14.0
21	12.0	12.0	13.0	14.0	15.0	15.0	17.0	16.0	19.0	20.0	16.0	14.0
22	12.0	12.0	13.0	14.0	15.0	15.0	17.0	16.0	19.0	20.0	16.0	13.0
23	12.0	12.0	13.0	14.0	15.0	15.0	17.0	16.0	19.0	19.0	16.0	13.0
24	12.0	12.0	13.0	14.0	15.0	15.0	17.0	16.0	19.0	19.0	16.0	13.0
25	12.0	12.0	13.0	14.0	16.0	15.0	18.0	16.0	19.0	19.0	16.0	13.0
26	12.0	12.0	13.0	14.0	16.0	15.0	18.0	16.0	19.0	19.0	16.0	13.0
27	12.0	12.0	13.0	14.0	16.0	15.0	18.0	16.0	19.0	18.0	16.0	13.0
28	12.0	12.0	13.0	14.0	16.0	16.0	18.0	16.0	19.0	18.0	16.0	13.0
29	12.0	12.0	13.0	14.0	16.0	16.0	18.0	16.0	19.0	18.0	16.0	13.0
30	12.0	12.0	13.0	14.0	16.0	16.0	19.0	16.0	19.0	18.0	16.0	13.0
31	12.0	12.0	13.0	14.0	16.0	16.0	19.0	16.0	19.0	18.0	16.0	13.0
Sum	365.0	336.0	401.0	424.0	460.0	470.0	535.0	508.0	566.0	597.0	477.0	448.0
Current Year 1986												
Period 1948-1986												
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			1	13.0	1	11.0	11.8	724	331	899		39.3
Feb.			1	12.0	1	12.0	12.0	666	287	746		40.5
Mar.			1	13.0	1	12.0	12.9	795	345	853		62.7
Apr.			1	15.0	1	13.0	14.1	841	357	1,000		66.8
May			125	16.0	1	14.0	14.8	912	369	966		58.3
June			1	16.0	118	15.0	15.7	932	387	1,030		67.4
July			130	19.0	1	16.0	17.3	1,061	446	1,260		72.8
Aug.			1	19.0	1	16.0	16.4	1,008	492	1,350		73.8
Sept.			1	19.0	1	17.0	18.9	1,123	481	1,370		53.6
Oct.			110	20.0	127	18.0	19.3	1,184	501	1,220		55.3
Nov.			1	17.0	110	15.0	15.9	946	450	1,240		57.7
Dec.			1	16.0	122	13.0	14.5	889	403	1,050		42.2
Yearly				20.0		11.0	15.3	11,081	4,849	12,429		774
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				0.57		0.31	0.43	13,668	5,981	15,331		955

Ø Mean daily

! And other days

PILOT KNOB POWER PLANT AND WASTEWAY NEAR PILOT KNOB, CALIFORNIA

DESCRIPTION: The Pilot Knob Power Plant and Wasteway is located on the All-American Canal, 20.8 miles (33.5 km) downstream from the intake at Imperial Dam, 6 miles (9.7 km) west of Yuma, about one mile (1.6 km) north of the northerly international boundary and empties into the old Alamo Canal in the United States and thence into the Colorado River through Rookwood gates, about one mile (1.6 km) upstream from the northerly international boundary. Water-stage recorder is located in forebay on right bank of the All-American Canal, 550 feet (168 m) upstream from wasteway gates and 1,800 feet (549 m) from entrance to the power plant. Datum of gage is 150.00 feet (45.72 m) above mean sea level. Tailrace gage is on left bank, 680 feet (207 m) downstream from power plant with automatic recording equipment in control house. All bypass gates are equipped with calibrated openings which are read on all gate changes. Datum of tailrace gage is at mean sea level; elevation of sill of wasteway gates is 147.88 feet (45.07 m), U. S. C. & G. S. datum. Prior to October 1956, this station was published as "Pilot Knob Wasteway near Pilot Knob, California."

RECORDS: Daily discharge is computed from flowmeter equipment and head and openings on wasteway gates or from head and gate opening on wicket and wasteway gates. Records furnished by the U. S. Geological Survey. Records available: July 1944 through 1986. The wasteway was operated for the purpose of diverting Colorado River water to the Alamo Canal for use in Mexico from July 1944 to November 8, 1950 in accordance with arrangements between the United States and Mexico for emergency use of the All-American Canal facilities. Records since 1950 show water released through Pilot Knob Power Plant and Wasteway from the All-American Canal and returned to the Colorado River through Rookwood gates.

REMARKS: Pilot Knob Wasteway was completed in 1938, and the first flow occurred on February 5, 1939. Pilot Knob Power Plant was completed in January 1957, and the first flow occurred on January 14, 1957.

EXTREMES: Maximum mean daily discharge, 9,930 second-feet (281 m³/sec) on October 6, 1985; minimum daily discharge, no flow during long periods.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	9,100	6,560	6,480	5,780	4,240	7,070	5,670	5,400	7,530	6,160	8,310	9,120
2	9,120	7,220	7,600	5,500	4,470	6,630	5,550	6,050	7,120	6,350	8,660	9,250
3	8,780	6,370	6,850	5,410	4,630	6,200	5,700	6,300	7,310	6,540	8,330	9,190
4	8,480	4,710	6,630	5,980	5,470	5,740	6,530	5,840	7,030	6,860	6,790	8,820
5	9,060	4,600	6,660	6,280	5,170	5,730	6,250	5,850	7,120	7,050	6,060	9,240
6	9,300	4,600	6,170	6,760	5,080	6,140	7,170	6,200	7,250	6,700	5,490	9,020
7	9,280	4,580	6,480	6,360	5,120	6,650	6,580	5,710	7,350	7,000	5,490	9,010
8	9,300	4,590	7,070	5,770	5,550	6,930	5,970	5,850	7,120	7,050	5,480	9,060
9	8,570	4,610	7,280	5,070	5,700	6,810	5,630	6,470	6,960	7,260	5,490	9,070
10	8,150	4,910	7,100	4,270	6,340	6,490	5,660	7,110	6,830	9,230	5,500	9,030
11	8,530	6,280	8,120	4,720	6,760	6,240	5,980	6,220	6,950	9,290	5,490	9,040
12	7,820	5,980	7,530	5,570	5,940	6,010	6,380	6,640	7,170	9,260	5,490	9,030
13	5,720	6,110	7,060	6,710	5,340	6,290	6,550	6,590	7,440	9,080	5,490	9,030
14	5,160	6,290	7,130	6,310	5,330	6,360	5,790	5,880	7,360	9,010	5,490	9,020
15	5,420	6,840	7,770	6,290	5,230	6,730	5,630	6,100	6,840	9,010	5,480	8,690
16	5,520	7,610	7,970	6,220	5,450	6,230	5,800	6,610	6,660	9,020	5,500	6,150
17	5,960	6,900	7,500	4,870	6,260	5,920	5,820	7,000	6,620	9,020	5,510	4,440
18	6,060	6,600	6,690	4,950	7,270	5,360	6,060	6,540	6,720	9,020	5,500	4,880
19	6,090	6,120	6,280	5,490	6,560	5,560	6,510	6,530	6,950	9,020	5,520	6,400
20	6,760	5,470	6,050	5,960	6,380	6,060	6,750	5,990	6,810	8,880	5,530	5,570
21	5,360	4,720	5,670	5,020	6,280	6,380	6,220	6,120	6,920	8,460	5,530	5,970
22	5,480	4,670	5,750	4,460	6,220	6,740	6,520	6,660	6,480	8,470	5,520	5,420
23	5,320	4,950	6,240	4,340	6,190	5,940	5,760	6,870	6,770	8,220	5,510	5,870
24	5,440	5,600	5,610	4,100	6,420	5,500	7,310	7,280	7,070	8,180	5,530	7,400
25	5,660	6,510	4,840	4,370	6,710	5,540	6,860	7,100	6,790	8,360	5,540	7,590
26	6,160	6,780	4,600	4,870	6,400	5,580	7,030	7,500	6,760	8,550	5,530	6,810
27	6,650	6,410	4,560	6,290	5,820	6,380	7,460	7,450	7,080	8,280	5,490	6,110
28	5,280	6,310	5,150	5,700	5,790	6,380	6,760	7,030	7,290	8,260	5,490	6,000
29	5,290		6,360	4,830	5,680	6,210	6,340	7,220	6,680	8,080	6,670	5,420
30	5,360		7,550	4,240	6,160	5,940	5,440	7,640	6,390	8,160	8,420	5,410
31	6,400		6,560		6,680		5,170	8,120		8,470		6,580
Sum	213,580	162,900	203,310	162,490	180,640	185,740	192,850	203,870	209,370	252,300	179,830	231,640
Current Year 1986Period 1944-1986												
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			1	6	9,300	14	5,160	6,890	423,630	81,298	521,792	0
Feb.			16		7,610	7	4,580	5,820	323,107	54,968	408,040	0
Mar.			11	8	8,120	27	4,560	6,560	403,259	113,051	406,929	0
Apr.			6	6	6,760	24	4,100	5,420	322,294	131,356	362,400	0
May			18	7	7,270	1	4,240	5,830	358,294	62,603	368,438	0
June			1	7	7,070	18	5,360	6,190	368,410	100,380	406,592	0
July			27	7	7,460	31	5,170	6,220	382,512	145,195	415,398	0
Aug.			31	8	8,120	1	5,400	6,580	404,370	147,628	404,370	0
Sept.			1	7	7,530	30	6,390	6,980	415,279	90,102	479,683	0
Oct.			11	9	9,290	1	6,160	8,140	500,429	63,974	500,429	0
Nov.			2	8	8,660	1	5,480	5,990	356,687	61,241	493,884	0
Dec.			2	9	9,250	17	4,440	7,470	459,451	93,531	568,225	0
Yearly					9,300		4,100	6,520	4,717,722	1,145,327	4,864,696	0
	Meters		Cubic Meters per Second		Thousands of Cubic Meters							
				263		116	184	5,816,769	1,412,738	6,000,505		0

0 Mean daily

! And other days

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - DISCHARGES

DESCRIPTION: Water-stage recorder on the left (Arizona) bank and cableway at the point where the northerly international land boundary (California-Baja California) intersects the Colorado River, about 6.4 miles (10.3 km) downstream from Colorado River below Yuma Main Canal Wasteway, 5 miles (8.0 km) west of Yuma, Arizona, 1.1 miles (1.8 km) upstream from Morelos Diversion Structure, and about one mile (1.6 km) downstream from Rockwood Gate. Zero of the gage is at mean sea level, U. S. C. & G. S. datum. Station is operated by the United States Section of the Commission.

RECORDS: Based on 287 current meter measurements during the year, 1933 by the United States Section, 93 by the Mexican Section of the Commission, 1 by the U. S. Geological Survey, and a continuous record of gage heights. Discharges are computed on the basis of a water-stage recorder, 1,680 feet (512 m) upstream from the northerly international boundary where the remains of an old weir serve as a partial controlling section. A continuous gage height record is available November 15, 1948 through 1986; daily discharge records available January 1, 1950 through 1986.

REMARKS: Reservoirs on the Colorado River, including Lake Mead above Hoover Dam, where storage began in 1935, reservoirs on the Gila River, and many irrigation diversions and return flows regulate the river flow at this station except for infrequent flood flows. During 1986 the flow at this point represented the total amount of the Colorado River water which crossed the northerly international boundary.

EXTREMES: Prior to January 1935: Maximum instantaneous discharge estimated about 250,000 second-feet, (7,080 m³/sec), January 22, 1916; minimum discharge, no flow several days during August and September 1934; average annual flow 13,443,000 acre-feet (16,581,806,000 m³); maximum annual flow 25,480,000 acre-feet (31,429,325,000 m³), 1907; minimum annual flow 1,174,000 acre-feet (1,448,117,000 m³), 1934. Since January 1935: Maximum instantaneous discharge 40,600 second-feet (1,150 m³/sec) on August 20, 1983, minimum discharge, no flow during April 1935.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	18,400	18,600	12,000	14,800	10,800	24,100	15,900	13,300	15,000	13,900	10,800	13,300
2	17,500	19,300	13,100	14,600	10,900	23,500	16,100	13,600	14,600	14,200	11,400	12,600
3	16,500	18,400	13,100	14,400	11,100	22,900	16,100	14,400	13,900	14,200	10,700	12,500
4	16,900	*15,300	13,000	14,700	11,900	22,700	16,200	13,800	13,500	14,300	9,830	12,200
5	17,900	*12,300	13,400	15,100	11,400	22,000	16,200	13,300	13,200	14,600	10,500	12,600
6	17,900	8,420	12,800	15,600	11,200	22,500	17,200	13,600	12,600	14,300	10,600	12,500
7	18,500	6,730	12,800	15,200	11,100	22,600	16,100	13,300	13,200	14,200	10,300	13,200
8	18,000	7,690	14,100	14,400	12,100	22,100	15,200	13,100	13,300	13,800	10,900	12,600
9	17,800	12,100	14,600	13,800	13,000	19,800	14,800	13,900	12,800	12,300	11,900	12,100
10	16,900	13,100	13,500	13,000	14,800	18,100	14,500	15,000	12,300	14,800	11,800	12,600
11	17,100	14,200	14,700	13,600	17,400	17,900	14,500	13,800	12,200	15,000	10,900	12,300
12	17,300	14,300	14,400	13,500	17,100	17,400	14,600	14,200	12,500	14,900	10,700	12,600
13	17,000	14,800	14,100	13,800	16,200	17,400	15,500	15,200	13,000	13,900	10,700	12,900
14	16,700	15,200	15,100	12,500	16,200	17,500	14,500	14,200	13,800	12,900	10,800	13,800
15	16,900	15,700	17,100	12,100	17,700	17,800	13,900	14,500	12,900	12,400	11,200	13,800
16	16,100	16,900	18,600	12,200	19,800	16,600	14,900	15,200	12,600	12,300	11,600	13,200
17	15,500	16,500	17,700	11,100	22,100	16,000	14,900	16,100	12,900	12,700	11,400	13,600
18	14,400	*15,800	16,800	11,000	23,900	15,600	15,100	14,700	12,900	12,700	12,300	13,100
19	15,000	*15,400	15,900	11,300	22,600	15,800	15,500	14,600	13,100	12,800	13,000	13,700
20	15,700	14,600	15,800	11,700	22,400	16,600	15,700	14,100	12,800	11,800	12,700	13,800
21	15,900	13,600	15,500	11,200	22,500	17,100	14,700	14,000	13,200	10,900	12,300	16,100
22	16,700	13,500	16,500	10,800	22,200	17,400	15,100	14,800	12,600	11,100	12,900	15,900
23	16,800	14,100	17,300	10,800	22,500	15,900	16,900	14,200	13,300	10,700	13,400	16,800
24	17,400	13,800	15,400	10,400	22,600	15,600	17,100	14,000	14,200	10,700	12,500	19,100
25	17,700	12,800	14,000	10,400	23,200	15,500	16,600	13,200	14,500	11,100	12,000	19,300
26	18,200	12,400	13,900	10,900	22,800	15,600	16,400	13,800	14,600	11,300	11,900	18,500
27	17,000	11,500	13,700	12,600	22,200	16,400	16,800	14,000	15,300	11,100	12,400	18,100
28	16,600	11,500	13,700	12,000	22,600	16,300	15,700	13,800	16,000	10,900	12,000	18,000
29	16,700	15,000	10,900	22,700	16,500	15,200	14,100	14,600	10,800	12,300	17,300	17,300
30	17,000	17,200	10,700	23,100	16,600	14,200	14,600	13,900	10,700	13,400	16,900	16,900
31	17,700	15,700	15,700	23,000	13,500	15,900	15,900	10,800	10,800	10,800	18,300	18,300
Sum	525,700	388,540	460,500	379,100	563,100	551,800	479,600	440,300	405,300	392,100	349,130	453,300
Current Year 1986												
Period 1935-1986												
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	110.60	108.14	7	18,800	18	14,100	17,000	1,042,711	431,903	1,644,000	31,900	
Feb.	110.40	106.32	3	20,000	7	6,220	13,900	770,658	359,490	1,382,678	60,400	
Mar.	109.43	107.55	16	19,400	1	11,400	14,900	913,388	377,414	1,259,702	19,400	
Apr.	108.37	106.68	6	16,500	24	10,000	12,600	751,934	315,387	1,072,264	0	
May	111.42	106.76	18	24,400	2	10,600	18,200	951,273	316,266	1,151,000	71,405	
June	111.46	109.33	1	24,800	25	15,200	18,400	1,094,479	319,058	1,321,388	8,500	
July	110.88	108.55	23	18,500	31	13,100	15,500	951,272	338,335	1,867,835	24,400	
Aug.	110.27	108.41	17	16,500	8	12,500	14,200	873,322	350,388	2,015,207	43,800	
Sept.	110.75	108.28	29	16,500	115	11,900	13,500	803,901	309,210	1,853,355	42,956	
Oct.	109.75	107.32	110	15,200	21	10,500	12,600	777,719	304,420	1,960,066	42,956	
Nov.	108.77	* 106.26	30	14,200	4	8,890	11,600	692,489	339,471	1,532,231	41,403	
Dec.	110.36	107.43	25	19,800	8	11,900	14,600	899,107	426,720	1,832,000	42,000	
Yearly	111.46	* 106.26		24,800		6,220	14,800	10,687,874	4,188,062	15,430,412	722,100	
Meters												
Cubic Meters per Second												
Thousands of Cubic Meters												
	33.97	32.39		702		176	419	13,183,279	5,165,891	19,033,105	890,696	

* Partly estimated ! And other days

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - STAGES

(See preceding Page for Description)

MEAN DAILY GAGE HEIGHT IN FEET 1986

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	110.40	109.96	108.44	107.93	106.82	111.33	109.51	108.58	109.78	109.67	107.50	108.23
2	110.09	110.26	108.48	107.91	106.84	111.15	109.62	108.77	109.63	109.67	107.73	107.94
3	109.74	109.82	108.23	107.84	106.94	111.03	109.78	109.07	109.42	109.26	107.43	107.92
4	109.88	108.34	108.09	107.86	107.31	110.96	109.88	108.86	109.27	109.03	*106.83	107.69
5	110.26	*107.12	107.92	107.88	107.24	110.71	109.88	108.68	109.16	109.12	107.12	107.82
6	110.25	106.76	107.74	108.04	107.19	110.80	110.23	108.80	108.89	109.01	107.18	107.79
7	110.44	106.67	107.79	107.93	107.11	110.81	109.53	108.46	109.13	108.95	107.03	108.10
8	110.23	106.53	107.94	107.70	107.55	110.65	109.23	108.55	108.97	108.80	107.36	107.84
9	109.96	106.88	107.91	107.66	108.00	110.09	109.17	108.85	108.61	108.15	107.90	107.54
10	109.41	107.18	107.80	107.86	109.07	109.69	109.08	109.30	108.41	109.21	107.88	107.81
11	109.60	107.69	107.99	108.16	109.93	109.68	109.12	109.09	108.40	109.34	107.33	*107.70
12	109.63	107.76	107.89	108.21	109.89	109.54	109.24	109.25	108.64	109.25	107.21	*107.83
13	109.51	108.09	107.84	108.21	109.60	109.65	109.57	109.42	108.86	108.85	107.23	107.96
14	109.39	108.28	107.87	107.90	109.62	109.89	109.22	109.05	109.16	108.42	107.31	108.66
15	109.44	108.53	108.12	107.80	110.10	110.12	108.96	109.19	109.00	108.26	107.50	108.36
16	109.13	109.12	108.38	107.78	110.69	109.79	109.23	109.47	108.75	108.22	107.69	108.05
17	108.87	108.89	108.63	107.49	110.97	109.56	109.21	109.87	108.93	108.35	107.60	108.26
18	108.25	108.60	108.45	107.43	111.33	109.46	109.31	109.55	110.03	108.35	108.04	108.03
19	108.54	108.46	108.05	107.44	110.92	109.57	109.48	109.54	109.18	108.41	108.37	108.25
20	108.95	108.12	108.10	107.42	110.87	109.84	109.61	109.33	109.08	107.99	108.19	108.27
21	109.02	107.68	108.15	107.15	110.94	109.97	109.32	109.29	109.24	107.53	108.07	109.19
22	109.26	107.58	108.35	107.07	110.76	110.06	109.50	109.58	109.02	107.66	108.32	109.14
23	109.20	107.85	108.57	107.13	110.70	109.53	109.97	109.34	109.31	107.42	108.54	109.37
24	109.36	107.79	108.25	107.05	110.88	109.45	109.90	109.28	109.91	107.43	108.10	110.17
25	109.46	107.56	108.22	107.06	111.08	109.44	109.73	109.00	110.09	107.64	107.85	110.18
26	109.62	107.76	108.29	107.20	110.96	109.47	109.72	109.04	110.14	107.70	107.81	109.70
27	109.15	107.96	108.24	107.44	*110.79	109.76	110.00	109.08	110.36	107.64	108.06	109.46
28	108.98	108.23	108.16	107.12	*110.86	109.69	109.60	109.01	110.62	107.60	107.82	109.39
29	109.05		108.25	106.81	110.91	109.79	109.34	109.32	110.11	107.50	108.95	109.08
30	109.13		108.31	106.81	111.05	109.81	108.91	109.61	109.80	107.50	108.47	108.93
31	109.58		108.05		111.00		108.63	110.12		107.48		109.34
Avg.	109.48	108.05	108.15	107.58		110.04	109.47	109.17	109.33	108.37	107.75	108.52

* Partly estimated

COOPER WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir on wasteway for discharging regulatory waste water from the Cooper Canal to the Colorado River. This wasteway is located 0.5 mile (0.8 km) downstream from the northerly international boundary and 0.6 mile (1.0 km) upstream from Morelos Diversion Dam. Prior to July 14, 1971, the wasteway was located 0.4 mile (0.6 km) downstream from Morelos Diversion Dam. This wasteway discharges waste water from the Valley Division of the Yuma Project in the United States into the Colorado River. Since July 14, 1971, zero of the gage is 117.64 feet (35.86 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge March 1950 through 1986 obtained by the United States Section; monthly discharge, January 1934 through 1950 by the Bureau of Reclamation.

EXTREMES: Prior to March 1950, maximum monthly discharge 914 acre-feet (1,127,000 m³) in January 1940; minimum monthly discharge, zero for various months. Since March 1950, maximum instantaneous discharge, 79.3 second-feet (2.25 m³/sec) on June 19, 1965, at a maximum gage height of 114.13 feet (34.79 m) (old datum); minimum instantaneous discharge, zero during parts of most months.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.2	1.6	1.5	0.1	0	0.6	0.3	0	3.5	0.1	4.3	0.1
2	1.3	0.1	2.7	1.0	0	0.3	1.8	5.0	0.7	0	1.1	0.1
3	0.2	0	0.2	1.0	2.7	0.3	2.8	3.0	1.8	0	0.2	0
4	2.3	0	0.1	1.1	0.3	0.6	0.1	0.1	5.9	1.4	0	0
5	2.2	0	0.1	0.3	0.2	0.1	0	0	0.2	4.3	0	9.0
6	0.6	0	0.9	5.6	0.1	0.1	0	0	5.5	9.4	0	0.4
7	0.1	0.1	3.5	0.1	0.1	0.1	0	0	0.1	5.3	5.0	7.0
8	0.1	0	1.4	0	0.1	1.7	0	0	2.5	0.1	3.5	4.5
9	0.2	0.1	4.5	0	0.1	1.8	0	0.2	0.2	4.2	0.2	6.8
10	0.1	0	0.9	0	0.1	0.4	4.5	0.3	1.6	2.0	5.2	1.9
11	0.1	4.7	2.4	0.1	4.3	0.2	4.5	0.4	2.7	0.9	1.0	0.2
12	8.0	0.3	0.1	0.1	2.3	0.1	1.7	0.4	1.3	5.2	3.9	0
13	0.2	0.6	0	0	0.2	0	0.3	0.3	0.1	6.4	2.5	0.4
14	0.1	5.0	0	0	1.8	0	0.9	0.3	1.0	0.1	5.9	2.0
15	3.3	0.2	0	0.8	0.6	0.1	4.0	0.3	0.1	0.5	4.0	3.8
16	0.3	0.6	0	5.6	2.6	3.6	0.6	0.3	0.1	0.1	0.1	0.1
17	2.9	0.2	0	0.6	1.4	0	2.7	0.3	0.1	1.2	0.1	1.6
18	0.2	1.1	0	0	0.6	0	2.7	0.3	0	0.1	0.2	1.7
19	3.3	0.3	2.2	0.4	0.1	0	0.4	0.3	1.6	0	0.1	3.0
20	0.1	0.1	2.1	1.9	0	1.4	0.1	0.2	0.1	0	0.1	3.9
21	0.1	0	3.1	0	0	2.3	0.2	0.7	0.1	0.1	1.2	0
22	6.5	0	0.6	2.4	0	0.1	0.1	8.5	0.7	0.1	2.1	1.0
23	0.8	2.5	4.2	0.5	0	0	0.1	0.2	1.5	0.1	4.2	6.1
24	0.3	0.7	0.5	0.1	0.3	0.1	0.1	0.1	0.1	5.5	0.2	7.4
25	3.7	0.1	0.3	0.1	4.3	0.1	0	0	0.1	1.7	2.7	0.2
26	0.4	1.9	0.2	0	2.9	0.1	0	0	6.0	5.0	4.6	0
27	1.7	0.4	0.1	0	0.2	0.1	0	3.9	3.0	10.7	3.0	0
28	0.2	0.1	0.1	0	0.7	0	0.3	2.0	3.8	1.6	2.6	0.3
29	3.2	0	0	2.8	3.1	0.3	0.1	4.1	0.7	8.7	0.4	1.7
30	0.2	0.6	0.4	0.4	2.4	0.2	0	2.9	0.1	3.5	0.1	10.7
31	6.0	0.1	0.1	0	1.9	0	0	2.4	0	0.6	0	12.1
Sum	57.9	20.7	32.4	25.0	33.4	14.7	28.3	36.5	45.2	78.9	58.5	86.0
Current Year 1986									Period 1935-1986			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	1.36	0	1	21.6	18	0	1.9	115	154	914	0	
Feb.	1.38	0	19	22.0	13	0	0.7	41.1	135	400	6.0	
Mar.	1.34	0	7	21.1	113	0	1.0	64.3	145	517	0	
Apr.	1.43	0	16	23.0	18	0	0.8	49.6	150	425	16.7	
May	1.36	0	3	21.6	11	0	1.1	66.2	149	440	31.7	
June	1.18	0	16	17.8	112	0	0.5	29.2	137	595	22.6	
July	1.39	0	15	22.2	11	0	0.9	56.1	130	516	0	
Aug.	1.50	0	27	24.5	14	0	1.2	72.4	100	617	0	
Sept.	1.41	0	28	22.6	19	0	1.5	89.7	103	462	0	
Oct.	2.17	0	26	39.2	12	0	2.5	156	129	490	0	
Nov.	1.57	0	26	26.0	14	0	2.0	116	147	462	9.0	
Dec.	1.93	0	5	33.9	13	0	2.8	171	166	592	13.7	
Yearly	2.17	0		39.2		0	1.4	1,027	1,645	4,500	638	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	0.66	0		1.11		0	0.04	1,267	2,029	5,551	787	

■ Estimated

■ Partly estimated

! And other days

COLORADO RIVER IMMEDIATELY ABOVE MORELOS DAM - STAGES

DESCRIPTION: Water-stage recorder located on the right bank of the Colorado River in Mexico attached to the upstream abutment of the gates of the Intake Canal at Morelos Dam, 1.1 miles (1.8 km) downstream from the northerly international boundary, and about 7.5 miles (12.1 km) downstream from the Colorado River below Yuma Main Canal Wasteway. Since April 17, 1969, zero of the gage is at mean sea level, U. S. C. & G. S. datum; prior to that date, zero of the gage was 0.16 foot (0.05 m) below mean sea level.

RECORDS: Records obtained and furnished by the Mexican Section of the Commission. Records available: Staff gage height records November 8, 1950 to June 3, 1951; a continuous record of gage heights June 4, 1951 through 1986.

REMARKS: Prior to June 4, 1951, when a continuous water-stage recorder was installed, mean daily gage height records were determined from hourly readings of a staff gage.

EXTREMES: Since November 8, 1950: Maximum mean daily elevation above mean sea level, 114.44 feet (34.88 m) on August 18, 1983; minimum mean daily elevation above mean sea level, 101.51 feet (30.94 m) on February 17, 1957.

MEAN DAILY GAGE HEIGHT IN FEET 1986

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	109.81	109.38	107.81	106.96	105.94	110.33	108.69	107.81	109.22	109.38	106.66	107.28
2	109.48	109.71	107.64	106.92	105.94	110.10	108.79	108.01	109.09	109.38	106.89	106.99
3	109.15	109.22	107.38	106.86	106.00	110.01	108.96	108.33	108.86	108.56	106.50	106.96
4	109.28	107.58	107.19	106.79	106.36	109.91	109.09	108.14	108.69	108.04	105.84	106.73
5	109.68	106.36	106.96	106.79	106.43	109.74	109.09	107.91	108.56	108.17	106.14	106.86
6	109.68	106.30	106.79	106.96	106.43	109.91	109.45	108.04	108.23	108.07	106.23	106.86
7	109.88	106.40	106.86	106.96	106.30	109.91	108.79	107.87	108.53	108.01	106.07	107.15
8	109.61	106.10	106.89	106.79	106.73	109.68	108.40	107.74	108.37	107.87	106.40	106.92
9	109.32	105.97	106.82	106.79	107.19	109.15	108.37	108.10	107.97	107.22	106.96	106.59
10	108.92	106.23	106.79	107.05	108.20	108.66	108.30	108.60	107.81	108.27	106.99	106.86
11	108.99	106.73	106.89	107.32	109.19	108.60	108.33	108.37	107.78	108.40	106.40	106.79
12	109.02	106.86	106.86	107.38	109.12	108.40	108.50	108.56	108.07	108.33	106.30	106.89
13	108.96	107.22	106.89	107.32	108.86	108.56	108.89	108.76	108.30	107.94	106.30	107.19
14	108.83	107.38	106.92	107.09	108.86	108.83	108.50	108.37	108.66	107.51	106.40	107.38
15	108.86	107.68	107.15	106.99	109.35	109.06	108.20	108.53	108.40	107.35	106.56	107.38
16	108.53	108.37	107.61	106.96	109.91	108.79	108.46	108.83	108.30	107.32	106.73	107.09
17	108.23	108.17	108.01	106.82	110.17	108.60	108.46	109.28	108.53	107.45	106.69	107.32
18	107.58	107.87	107.74	106.76	110.53	108.46	108.56	108.92	108.66	107.48	107.12	107.09
19	107.91	107.74	107.32	106.63	110.24	108.60	108.76	108.92	108.83	107.55	107.41	107.32
20	108.33	107.38	107.35	106.46	110.20	108.89	108.89	108.73	108.73	107.12	107.25	107.28
21	108.40	106.92	107.38	106.30	110.27	109.06	108.60	108.66	108.89	106.69	107.15	108.20
22	108.63	106.82	107.51	106.30	110.07	109.12	108.83	108.96	108.73	106.82	107.41	108.23
23	108.60	107.12	107.68	106.36	110.04	108.63	109.25	108.69	109.06	106.56	107.64	108.43
24	108.76	107.05	107.35	106.33	110.07	108.56	109.15	108.60	109.68	106.59	107.19	109.22
25	108.89	106.89	107.35	106.40	110.24	108.60	108.99	108.30	109.88	106.82	106.92	109.22
26	109.06	107.15	107.41	106.43	110.14	108.63	109.02	108.33	109.91	106.86	106.86	108.79
27	108.56	107.38	107.35	106.43	109.94	108.92	109.32	108.40	110.14	106.82	107.12	108.56
28	108.37	107.64	107.22	106.10	110.01	108.86	108.92	108.30	110.37	106.73	106.86	108.53
29	108.43		107.15	105.91	110.01	108.96	108.60	108.69	109.81	106.69	106.96	108.27
30	108.53		107.19	105.94	110.14	108.99	108.17	108.99	109.51	106.73	107.48	108.14
31	108.99		107.02	110.07			107.87	109.58		106.63		108.50
Avg.	108.89	107.35	107.25	106.69	108.79	109.09	108.73	108.50	108.86	107.51	106.79	107.58

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - DISCHARGES

DESCRIPTION: Water-stage recorder and staff gage on left bank of Intake Canal, 200 feet (61.0 m) downstream from the intake at Morelos Dam, 1,350 feet (410 m) upstream from the point where it joins the old Alamo Canal, 2.2 miles (3.5 km) upstream from Matamoros Check, and about one mile (1.6 km) south of the northerly international boundary. The zero of the gage is 0.16 foot (0.05 m) below mean sea level, U. S. C. & G. S. datum.

RECORDS: The records are deduced from the flows arriving in the limtrophe section of the Colorado River at the northerly international boundary, the flows that pass downstream from the structure, and leakage through the structure. Records available: November 8, 1950 through 1986. Records obtained and furnished by the Mexican Section of the Commission.

REMARKS: The canal is operated with a minimum hydraulic slope to permit the maximum retention of silt above Matamoros Check, and the lower velocities in the canal do not permit measuring the flow with a current meter. Records for this station show the amounts of Colorado River water diverted at Morelos Diversion Dam to the Intake Canal and thence to the Alamo Canal for use in Mexico. Under conditions set forth in the 1944 Water Treaty, water for use in Mexico may be diverted to the Alamo Canal in the United States directly from the river at Rockwood Heading or by means of Imperial Dam, the All-American Canal, and certain facilities of the Imperial Irrigation District. No diversions of this nature have been made during the years 1951 through 1986, and consequently the records reported below show the total water diverted from the Colorado River to the Alamo Canal during those years. Mexico occasionally pumps water from the Colorado River at other points below Morelos Dam when water is available in the channel.

EXTREMES: Maximum mean daily discharge, 6,600 second-feet (187 m³/sec), July 12 and 14, 1983; maximum mean daily gage height, 107.32 (32.71 m) March 30 and 31, 1985, and March 1, 1986. Minimum daily discharge, no flow on various occasions.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,290	3,530	5,510	6,180	4,410	3,850	4,340	4,130	3,810	2,270	1,940	2,560
2	3,310	3,570	5,690	6,000	4,270	3,920	4,310	4,310	3,670	2,250	2,030	2,510
3	3,290	3,510	5,720	5,970	4,130	3,880	4,170	4,380	3,640	2,320	2,060	2,460
4	3,310	3,520	6,000	5,790	4,130	3,850	4,030	4,380	3,600	2,350	2,190	2,490
5	3,330	3,450	6,180	5,620	4,170	3,990	4,060	4,380	3,600	2,340	2,190	2,480
6	3,290	3,510	5,860	5,650	4,170	4,130	4,030	4,380	3,570	2,320	2,150	2,430
7	3,250	3,500	5,790	5,580	4,170	4,200	4,030	4,340	3,570	2,330	2,230	2,530
8	3,370	3,220	5,830	5,440	3,960	4,240	4,030	4,380	3,570	2,340	2,200	2,430
9	3,670	3,040	5,760	5,400	3,810	4,410	4,060	4,450	3,570	2,400	2,130	2,440
10	3,640	2,980	5,650	5,620	3,740	4,560	4,100	4,560	3,530	2,250	2,090	2,400
11	3,710	2,970	5,650	5,970	3,570	4,660	4,130	4,590	3,450	2,140	2,140	2,260
12	3,670	3,260	5,580	6,180	3,420	4,730	4,130	4,380	3,400	2,170	2,120	2,330
13	3,640	3,570	5,580	6,390	3,430	4,410	4,100	4,310	3,410	2,240	2,080	2,380
14	3,640	3,600	5,580	6,070	3,460	3,810	4,100	4,240	3,350	2,320	2,110	2,370
15	3,670	3,640	5,540	5,830	3,460	3,570	4,060	4,170	3,310	2,310	2,170	2,360
16	3,530	3,640	5,540	5,790	3,530	3,670	4,030	4,130	3,120	2,290	2,180	2,390
17	3,600	3,600	5,510	5,720	3,480	3,740	3,990	4,100	2,900	2,270	2,180	2,360
18	3,780	3,600	5,440	5,650	3,430	3,810	3,960	4,100	2,720	2,250	2,120	2,380
19	3,850	3,570	5,300	5,580	3,490	3,810	3,960	4,100	2,640	2,150	2,200	2,440
20	3,880	3,530	5,120	5,400	3,600	3,850	3,960	3,990	2,640	2,090	2,200	2,410
21	3,850	3,640	5,050	5,190	3,670	3,960	3,990	3,920	2,640	2,020	2,110	2,430
22	3,880	3,960	5,120	5,010	3,740	4,030	3,990	3,920	2,660	2,060	2,160	2,490
23	3,850	4,060	5,190	5,050	3,810	4,060	3,960	3,990	2,610	2,050	2,130	2,480
24	3,880	4,060	5,330	5,010	3,810	4,030	3,960	4,100	2,360	2,010	2,210	2,330
25	3,850	4,240	5,720	5,010	3,780	4,030	3,960	4,170	2,150	1,990	2,120	2,320
26	3,850	4,590	6,180	5,050	3,740	4,060	3,960	4,170	2,070	1,970	2,170	2,230
27	3,810	4,560	6,430	5,090	3,740	4,100	3,960	4,030	2,060	1,920	2,290	2,250
28	3,850	4,940	6,570	4,940	3,710	4,270	3,880	3,990	2,040	2,000	2,380	2,220
29	3,810		6,570	4,700	3,710	4,340	3,780	3,990	2,070	2,050	2,460	2,140
30	3,640		6,570	4,520	3,710	4,340	3,880	3,990	2,190	1,880	2,560	2,130
31	3,530		6,390		3,710		3,960	3,990		1,910		2,150
Sum	112,520	102,860	177,950	165,400	116,960	122,310	124,860	130,060	89,920	67,260	65,300	73,580
Current Year 1986												
Period 1950-1986												
Month	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Low			Average	Maximum	Minimum		
Jan.	106.40	105.68	120	3,880	7	3,250	3,640	223,193	84,896	223,193		996
Feb.	107.41	105.22	28	4,940	11	2,970	3,670	203,958	81,411	203,958		9,232
Mar.	107.11	106.17	128	6,570	21	5,050	5,760	352,959	186,540	352,959		97,902
Apr.	107.09	105.35	13	6,390	30	4,520	5,510	328,093	211,987	328,093		153,792
May	105.84	104.76	1	4,410	112	3,420	3,780	232,004	111,749	232,004		66,207
June	105.84	104.72	12	4,730	15	3,570	4,060	242,637	163,389	269,632		95,177
July	105.81	105.31	1	4,340	29	3,780	4,030	247,541	227,398	356,040		125,745
Aug.	106.36	105.15	11	4,590	121	3,920	4,200	257,907	228,417	341,044		130,298
Sept.	105.41	103.94	1	3,810	28	2,040	3,000	178,335	138,365	273,177		53,633
Oct.	104.49	103.84	9	2,400	30	1,880	2,170	133,444	69,655	227,651		10,453
Nov.	104.49	103.71	30	2,560	1	1,940	2,180	129,500	58,540	209,478		7,516
Dec.	104.49	103.77	1	2,560	30	2,130	2,370	145,918	89,328	200,974		8,825
Yearly	107.41	103.71		6,570		1,880	3,710	2,675,488	1,647,192	2,798,192		1,272,332
Meters												
Cubic Meters per Second												
Thousands of Cubic Meters												
	32.74	31.61		186		53.3	105	3,300,179	2,031,790	3,451,533		1,569,404

! And other days

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - STAGES

(See Preceding Page for Description)

MEAN DAILY GAGE HEIGHT IN FEET 1986

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	105.81	106.00	107.32	106.56	105.58	104.99	105.74	105.77	105.31	104.17	103.81	104.40
2	105.81	106.00	107.12	106.56	105.58	104.99	105.61	105.87	105.15	104.23	103.90	104.43
3	105.81	105.94	106.89	106.50	105.61	104.99	105.61	105.94	105.02	104.36	103.97	104.40
4	105.81	105.94	106.76	106.46	105.71	105.05	105.58	105.94	105.02	104.33	104.04	104.40
5	105.81	105.87	106.53	106.46	105.64	105.22	105.64	105.97	105.12	104.33	104.07	104.40
6	105.81	105.87	106.40	106.46	105.68	105.35	105.64	106.00	105.22	104.33	104.00	104.30
7	105.81	105.97	106.43	106.40	105.61	105.41	105.74	106.00	105.18	104.30	104.07	104.40
8	105.87	105.68	106.43	106.40	105.38	105.54	105.77	106.17	105.12	104.27	104.10	104.30
9	105.97	105.41	106.40	106.40	105.28	105.71	105.74	106.27	105.09	104.36	104.04	104.40
10	106.07	105.35	106.43	106.69	105.09	105.84	105.71	106.27	105.09	104.23	103.84	104.33
11	106.10	105.31	106.50	106.99	104.99	105.81	105.74	106.07	104.99	104.20	103.84	104.20
12	106.14	105.68	106.43	107.05	104.95	105.81	105.71	105.91	105.02	104.23	103.84	104.27
13	106.14	106.00	106.43	106.96	104.95	105.51	105.61	105.81	104.99	104.20	103.84	104.33
14	106.10	106.04	106.50	106.69	104.95	104.99	105.54	105.81	104.82	104.23	103.84	104.20
15	106.17	106.00	106.53	106.63	104.95	104.86	105.54	105.71	104.66	104.27	103.87	104.27
16	106.10	105.97	106.46	106.56	104.95	105.09	105.58	105.68	104.53	104.27	104.04	104.30
17	106.20	105.97	106.46	106.43	104.95	105.12	105.51	105.64	104.33	104.23	103.94	104.30
18	106.30	106.00	106.50	106.40	104.92	105.05	105.54	105.58	104.23	104.27	103.87	104.33
19	106.33	105.97	106.46	106.23	104.95	105.25	105.58	105.51	104.20	104.23	104.00	104.30
20	106.33	105.94	106.50	106.07	104.95	105.41	105.64	105.45	104.17	104.17	104.00	104.30
21	106.30	106.04	106.53	105.87	104.92	105.41	105.71	105.48	104.20	104.20	103.87	104.36
22	106.33	106.36	106.59	105.91	104.92	105.48	105.61	105.58	104.30	104.13	103.90	104.40
23	106.30	106.46	106.73	105.94	104.95	105.45	105.48	105.71	104.36	104.07	103.81	104.40
24	106.36	106.40	106.86	105.91	104.92	105.54	105.48	105.84	104.17	104.04	103.94	104.13
25	106.30	106.43	106.96	105.97	104.92	105.51	105.45	105.81	104.07	103.97	104.07	103.97
26	106.30	106.66	106.99	106.04	104.89	105.54	105.41	105.87	104.07	103.90	104.07	103.94
27	106.27	106.89	106.96	106.00	104.82	105.64	105.48	105.81	104.07	103.87	104.13	103.94
28	106.33	107.19	106.79	105.68	104.86	105.74	105.41	105.77	104.04	103.87	104.17	103.94
29	106.30		106.69	105.51	104.82	105.81	105.41	105.68	104.13	103.84	104.33	103.94
30	106.14		106.63	105.58	104.82	105.77	105.48	105.61	104.17	103.71	104.43	103.97
31	106.00		106.50		104.92		105.71	105.41		103.87		103.97
Avg.	106.10	106.04	106.63	106.30	105.12	105.38	105.61	105.81	104.63	104.13	104.00	104.17

COLORADO RIVER IMMEDIATELY BELOW MORELOS DAM - STAGES

DESCRIPTION: Water-stage recorder located on the right bank of the Colorado River in Mexico immediately downstream from Morelos Dam, 1.1 miles (1.8 km) downstream from the northerly international boundary, and about 7.5 miles (12.1 km) downstream from the Colorado River below Yuma Main Canal Wasteway. Since April 17, 1969, zero of the gage is at mean sea level, U. S. C. & G. S. datum; prior to that date, zero of the gage was 0.16 foot (0.05 m) below mean sea level.

RECORDS: Records obtained and furnished by the Mexican Section of the Commission. Records available: Staff gage heights, February 20, 1951 to June 6, 1966; continuous record of gage heights June 7, 1966 through 1986.

REMARKS: On June 7, 1966 a continuous water-stage recorder was installed; prior to this date, mean daily gage heights were determined from hourly readings of staff gage.

EXTREMES: Maximum mean daily gage height, 113.98 feet (34.74 m) on August 18, 1983; minimum mean gage height, 98.03 feet (29.88 m) several days during December 1982.

MEAN DAILY GAGE HEIGHT IN FEET 1986

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	108.40	108.07	104.07	105.97	104.76	109.78	107.55	106.59	107.78	107.87	106.50	107.15
2	108.14	108.30	104.72	105.87	104.92	109.61	107.68	106.73	107.68	107.84	106.69	106.86
3	107.91	107.94	104.69	105.81	105.15	109.51	107.78	106.96	107.51	107.84	106.36	106.82
4	108.01	106.69	104.63	106.17	105.61	109.48	107.87	106.82	107.41	107.91	105.77	106.63
5	108.30	105.12	104.92	106.40	105.38	109.28	107.87	106.66	107.28	108.01	106.04	106.76
6	108.33	103.18	104.82	106.69	105.18	109.42	108.14	106.73	107.05	107.94	106.10	106.73
7	108.50	102.26	104.79	106.59	105.18	109.45	107.64	106.63	107.25	107.87	105.97	107.05
8	108.30	102.85	105.45	106.20	105.77	109.28	107.32	106.53	107.12	107.71	106.30	106.79
9	108.07	105.22	106.17	106.00	106.27	108.53	107.22	106.79	106.79	107.09	106.86	106.50
10	107.74	105.84	105.35	105.35	107.45	107.91	107.12	107.15	106.66	108.07	106.86	106.76
11	107.84	106.50	105.74	105.48	108.20	107.84	107.12	107.02	106.66	108.27	106.33	106.66
12	107.84	106.33	105.74	105.31	108.14	107.71	107.25	107.15	106.86	108.23	106.20	106.79
13	107.78	106.33	105.61	105.71	107.97	107.78	107.48	107.32	107.02	107.81	106.23	106.92
14	107.68	106.50	106.27	105.12	108.01	107.94	107.19	107.02	107.32	107.38	106.30	107.28
15	107.68	106.73	107.02	104.82	108.40	108.17	106.96	107.12	107.09	107.19	106.50	107.32
16	107.45	107.25	107.45	105.09	108.96	107.87	107.15	107.41	106.99	107.19	106.63	107.02
17	107.22	107.09	107.25	104.27	109.28	107.71	107.15	107.74	107.15	107.25	106.66	107.19
18	106.69	106.86	106.92	104.20	109.55	107.48	107.22	107.51	107.25	107.32	107.05	107.02
19	106.92	106.73	106.63	104.63	109.28	107.48	107.38	107.51	107.38	107.38	107.32	107.22
20	107.28	106.43	106.53	105.12	109.35	107.68	107.48	107.38	107.32	106.99	107.15	107.22
21	107.35	106.04	106.40	104.63	109.42	107.84	107.28	107.32	107.45	106.50	107.05	108.17
22	107.55	105.94	106.69	104.23	109.38	108.01	107.71	107.55	107.32	106.66	107.32	108.10
23	107.51	106.17	106.79	104.27	109.48	107.58	108.04	107.35	107.58	106.43	107.55	108.33
24	107.64	106.17	106.04	104.04	109.55	107.41	106.36	107.28	108.07	106.40	107.09	109.12
25	107.71	105.48	105.28	103.90	109.71	107.45	107.94	107.05	108.23	106.59	106.79	109.12
26	107.84	104.99	105.02	104.23	109.65	107.51	108.04	107.09	108.23	106.69	106.76	108.66
27	107.48	104.49	104.95	105.18	109.51	107.74	108.23	107.15	108.43	106.66	106.99	108.46
28	107.28	104.17	105.18	105.22	109.55	107.68	107.94	107.05	108.60	106.59	106.76	108.40
29	107.35		105.91	104.76	109.55	107.74	107.61	105.35	108.23	106.53	106.79	108.14
30	107.45		106.73	104.56	109.65	107.78	107.15	107.58	107.97	106.53	107.38	108.01
31	107.78		106.36		109.55		106.69	108.04		106.46		108.37
Avg.	107.71	105.91	105.81	105.18	108.01	108.23	107.51	107.15	107.45	107.25	106.69	107.48

ELEVEN MILE WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir on wasteway for discharging water from the West Main Canal to the Colorado River. This wasteway is located in Arizona, 4.3 miles (6.9 km) downstream from the northerly international boundary and 3.2 miles (5.1 km) downstream from Morelos Diversion Dam. It is the largest of three wasteways discharging waste water from the Valley Division of the Yuma Project in the United States into the limitrophe section of the Colorado River. Since June 1986, zero of the gage is 111.72 feet above mean sea level, U. S. C. & G. S. datum; prior to that date, zero of the gage was mean sea level, U. S. C. & G. S. datum.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through 1986, obtained by the United States Section; monthly discharge, January 1924 through 1950 by Bureau of Reclamation.

EXTREMES: Prior to January 1951, maximum monthly discharge, 9,740 acre-feet (12,014,000 m³) in August 1940; minimum monthly discharge, zero in April 1941. Since January 1, 1951, maximum instantaneous discharge, 800 second-feet (22.7 m³/sec) on December 3, 1961, at a maximum gage height of 117.60 feet (35.84 m); minimum instantaneous discharge, zero during parts of most years.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.7	0.5	1.0	0.2	0	1.0	1.0	0.2	0.5	3.3	0.2	24.8
2	1.1	52.6	17.3	0.4	0.1	0	0.9	0.2	0.3	0.3	53.7	3.1
3	1.1	32.6	17.2	0.2	0	0.2	2.9	33.3	0.2	0.9	34.8	2.1
4	1.6	5.5	5.1	0.3	0	0.1	6.4	12.4	0	1.3	2.7	2.4
5	7.6	3.2	2.8	0.4	0	0.2	0.8	3.3	0.1	1.4	1.5	3.5
6	5.9	0.2	0.9	41.1	0.4	0	4.2	2.4	8.9	2.1	7.2	2.6
7	10.0	0.2	0.5	17.1	0.5	0	1.9	0.5	0	1.4	3.6	3.9
8	11.4	0.3	0.6	3.3	0.3	0	4.3	0.5	1.7	2.4	14.3	2.1
9	0.4	0.4	0.5	2.6	0.1	0.2	0.5	0.3	0.3	3.0	6.9	0.3
10	6.8	2.3	0.3	0.4	1.5	0.6	0.3	0.1	0.5	8.4	7.0	5.4
11	1.7	0.2	0.5	1.6	0	1.2	0.1	1.0	0.7	2.3	5.3	1.3
12	2.0	0.1	5.6	0.3	2.7	0.3	0.2	1.4	16.0	1.9	4.6	5.7
13	3.3	1.7	0.7	0.1	2.1	0.2	6.5	0.8	0.6	1.7	1.6	4.2
14	1.4	0.6	1.8	0.1	1.9	7.0	0.5	3.3	1.1	7.7	5.3	0.5
15	1.4	0.8	0.3	0.1	1.5	0.1	0.5	0.5	2.5	1.6	4.5	0.8
16	0.8	1.4	0.3	0.1	0.4	1.4	0.6	0.8	1.8	1.7	3.8	6.2
17	0.6	0.4	0.4	0.8	0.2	0.4	0.1	2.4	2.7	0.8	3.6	15.6
18	1.6	0.8	0.9	0.4	58.7	2.0	0.1	0.8	2.5	1.3	16.3	20.9
19	0.9	1.3	0.6	0.4	14.9	0.4	0.1	0.6	2.3	2.9	1.9	4.8
20	0.9	1.3	0.5	0.2	1.2	1.0	0.2	0.4	0.8	3.5	4.4	12.9
21	0.2	1.2	0.4	0.7	0.6	0.3	0.2	0.6	0.4	1.2	1.5	6.0
22	0.8	0.5	0.3	0.4	0.9	2.1	0	0.4	3.8	1.4	10.8	3.0
23	0.9	0.5	0.3	0.5	0.7	0.2	0.3	0	1.0	2.4	3.9	4.0
24	3.0	2.7	0.4	0.4	0.4	1.5	0.9	0	0.3	0.4	1.5	15.5
25	1.2	0.3	0.3	0.4	0.3	3.6	0.4	0	1.3	0.2	2.5	0.5
26	0.2	0.4	0.4	0.1	0.1	2.0	12.5	0.1	4.3	4.0	3.8	0.4
27	0.3	0.3	0.4	2.4	1.0	2.8	0.1	0.7	8.8	8.6	0.5	3.8
28	0.3	0.4	0.4	1.0	0.4	1.9	0.6	0.4	21.3	5.6	2.6	0.6
29	0.7	0.4	0.4	0.4	0.3	9.4	0.8	0.1	0.9	0.9	1.0	1.5
30	0.4	0.3	0.3	0.3	0.2	4.2	0.3	0.8	1.5	1.2	45.8	4.7
31	2.6	0	0.5	0	1.5	0	0.9	0.9	0	1.6	0	0.9
Sum	72.8	112.7	61.9	76.7	92.9	44.3	49.1	69.2	87.1	77.4	257.1	164.0
Current Year 1986												
Period 1935-1986												
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	112.97	111.74	10	69.6	12	0.1	2.3	144	2,584	9,570	0	
Feb.	115.82	111.73	2	283	12	0.1	4.0	224	2,115	8,430	14.5	
Mar.	114.92	111.75	2	187	12	0.2	2.0	123	1,991	6,230	59.1	
Apr.	115.21	111.72	6	211	126	0	2.6	152	1,842	6,300	0	
May	116.45	111.72	18	390	11	0	3.0	184	2,178	9,320	8.3	
June	.72	0	14	32.0	11	0	1.5	87.9	2,075	7,440	10.5	
July	3.33	0	13	197	17	0	1.6	97.4	2,079	8,320	9.1	
Aug.	3.67	0	3	229	16	0	2.2	137	1,804	9,740	64.9	
Sept.	1.12	0	6	60.8	12	0	2.9	173	1,301	6,140	6.0	
Oct.	.87	0	14	43.2	25	0	2.5	154	1,773	5,680	11.9	
Nov.	4.49	0	2	342	5	0	8.6	510	2,150	8,220	18.8	
Dec.	2.22	0	1	124	6	0	5.3	325	2,819	9,430	61.9	
Yearly	116.45	111.72		390		0	3.2	2,311	24,711	82,900	943	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	35.49	34.05		11.0		0	0.09	2,851	30,481	102,255	1,163	

1 And other days

WELLTON-MOHAUK DRAINAGE WATER DISCHARGED TO COLORADO RIVER
BELOW MORELOS DAM

DESCRIPTION: Water-stage recorder located on downstream end of the Wellton-Mohawk Drainage Extension Channel on the Arizona bank of the Colorado River at the east end of the weir section of Morelos Dam, 1.1 miles (1.8 km) downstream from the northerly international boundary. The elevation of the zero of the gage has not been determined.

RECORDS: Based on discharge measurements and a continuous record of gage heights. Station is operated by the United States Section of the Commission. Records available: November 16, 1965 through 1986.

REMARKS: Pursuant to Minute 218 of the Commission, an extension to the Wellton-Mohawk Drainage Conveyance Channel was constructed along the left bank of the Colorado River to a point immediately below Morelos Dam, a distance of about 12 miles (19.3 km), and placed in operation on November 16, 1965. Drainage flows may be discharged on an emergency basis to the Gila River and thence to the Colorado River at the diversion structure, Main Outlet Drain Extension No. 1, at the upstream end of the extension; directly to the Colorado River at Main Outlet Drain Extension No. 2, 1.9 miles (3.1 km) upstream from Morelos Dam; and directly to the Colorado River immediately below Morelos Dam at this station, Main Outlet Drain Extension No. 3. On July 14, 1972, Minute No. 241 of the Commission became effective. The Minute called for discharge of all Wellton-Mohawk drainage waters to be made below Morelos Dam. On August 30, 1973, Minute No. 242 of the Commission became effective. The Minute called for construction of a concrete-lined bypass drain from Morelos Dam to the Santa Clara Slough in Mexico. On June 23, 1977, the first flow was recorded in the bypass drain. Drainage flows through Main Outlet Extension No. 3 will be only on an emergency basis.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	4.0	0	0	0	0	0	0	0
4	0	0	0	0	11.6	0	0	0	0	0	0	0
5	0	0	0	0	4.4	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0.4	0	0	0	0	0	0	0
8	0	0	0	1.6	0.7	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0.6	0	0	0	0	0	0	0
13	0	0	0	0	1.4	0	0	0	0	0	0	0
14	0	1.5	0	0	0	0	0	0	0	0	0	0
15	0	2.2	0	0	0	0	0	0	0	0	0	0
16	0	2.5	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0.3	0	0	0.1	0	0	0	0	0	0	0
19	0	0.2	0	0	0	0	0	0	0	0	0	0
20	0	0.4	0	0	0	0	0	0	0	0	0	0
21	0	0	0	1.1	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	1.5	0	0	0	0	0	0	0
26	0	0.7	0	0	0	0	0	0	0	0	0	0
27	0	2.3	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0.3	0	0	0	0	0	0	0	0
29	0	0	0	0.4	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0
Sum	0	10.1	0	3.4	0	0	0	0	0	0	0	0
Current Year 1986												
Period 1966-1986												
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	0	0	1	0	1	0	0	0	9,243	18,718	0	
Feb.	.31	0	1	11.9	1	0	0.4	20.0	7,195	16,992	0	
Mar.	0	0	1	0	1	0	0	0	5,022	18,506	0	
Apr.	.33	0	21	12.7	1	0	0.1	6.7	4,184	18,061	0	
May	.39	0	3	15.1	1	0	0.8	49.0	6,851	19,091	0	
June	0	0	1	0	1	0	0	0	5,391	18,756	0	
July	0	0	1	0	1	0	0	0	4,953	18,946	0	
Aug.	0	0	1	0	1	0	0	0	5,032	19,188	0	
Sept.	0	0	1	0	1	0	0	0	7,076	18,474	0	
Oct.	0	0	1	0	1	0	0	0	9,961	19,200	0	
Nov.	0	0	1	0	1	0	0	0	9,444	18,478	0	
Dec.	0	0	1	0	1	0	0	0	8,576	19,121	0	
Yearly	.39	0		15.1		0	0.1	75.7	82,928	214,781	0	
	Meters		Cubic Meters per Second					Thousands of Cubic Meters				
	0.12	0		0.43		0	0	93.4	102,290	264,928	0	

1 And other days

COLORADO RIVER AT ELEVEN MILE GAGE - STAGES

DESCRIPTION: Water-stage recorder on the left (Arizona) bank of the river, 4.3 miles (6.9 km) downstream from northerly international boundary, 3.2 miles (5.1 km) downstream from Morelos Diversion Dam, about 50 feet (15 m) downstream from the mouth of Eleven Mile Wasteway of the Yuma Project, and 11 miles (17.7 km) downstream from Yuma, Arizona, along the river levee. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Mean daily gage heights based on continuous water-stage records. Records available: Continuous record of gage heights, November 1947 through 1986; once weekly readings obtained by the U. S. Bureau of Reclamation, January 1940 through October 1947.

REMARKS: This station is maintained by the United States Section of the Commission as part of the continuing study of channel conditions in the limitrophe section of the river.

EXTREMES: Since November 1947, maximum mean daily gage height, 108.77 feet (33.15 m) on June 28, 1983; minimum mean daily gage height, 94.95 feet (28.94 m) on June 22, 1968.

MEAN DAILY GAGE HEIGHT IN FEET 1986

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	104.70	104.70	*100.79	102.22	101.18	106.04	103.85	102.94	104.03	104.22	103.34	103.97
2	104.54	104.86	*101.37	102.11	101.35	105.82	103.95	103.06	103.94	104.26	103.53	103.71
3	104.39	104.66	*101.46	102.07	101.59	105.71	104.06	103.32	103.78	104.22	103.30	103.48
4	104.49	103.65	*101.24	102.41	102.01	105.66	104.09	103.14	103.67	104.22	102.76	103.55
5	104.70	102.35	101.42	102.67	101.81	105.51	104.10	102.98	103.57	104.36	103.01	103.59
6	104.72	*100.83	101.31	102.98	101.56	105.62	104.36	103.08	103.36	104.34	103.06	103.79
7	104.83	*99.48	101.23	102.85	101.57	105.72	103.85	102.97	103.55	104.28	102.94	103.60
8	104.73	99.85	101.80	102.38	102.13	105.69	103.52	102.88	103.43	104.25	103.23	103.32
9	104.64	102.03	102.25	102.19	102.51	*104.98	103.43	103.13	103.15	103.71	103.69	103.58
10	104.39	102.67	101.77	101.52	103.61	*104.37	103.37	103.49	103.06	104.53	103.72	103.55
11	104.45	103.25	102.13	101.67	104.41	104.29	103.35	103.39	103.06	104.65	103.25	103.58
12	104.44	103.07	102.18	101.51	104.29	104.11	103.48	103.49	103.25	104.57	103.15	103.64
13	104.43	103.04	102.05	101.90	104.02	104.12	103.70	103.67	103.42	104.32	103.17	103.75
14	104.35	103.21	102.52	101.33	104.04	104.33	103.48	103.39	103.68	103.99	103.22	104.03
15	*104.34	103.39	103.28	101.08	104.42	104.54	103.28	103.48	103.53	103.89	103.39	104.08
16	*104.17	103.83	103.72	101.31	105.10	104.24	103.48	103.72	103.45	103.86	103.49	103.83
17	*103.99	*103.67	103.53	100.64	105.31	104.07	103.46	104.04	103.63	103.95	103.49	104.03
18	*103.60	*103.41	103.24	100.55	105.51	103.90	103.53	103.80	103.72	104.01	103.81	103.84
19	*103.71	103.29	103.00	100.94	105.28	103.90	103.64	103.81	103.83	104.07	104.07	104.02
20	104.07	103.04	102.88	101.46	105.23	104.12	103.74	103.66	103.77	103.78	103.93	104.05
21	104.08	102.72	102.74	101.12	105.32	104.29	103.50	103.61	103.91	103.34	103.86	104.74
22	104.24	102.61	102.98	100.71	105.36	104.48	103.63	103.82	103.81	103.46	104.06	104.69
23	104.24	102.58	103.09	100.77	105.50	104.05	104.23	103.66	104.00	103.27	104.23	104.84
24	104.33	102.81	102.42	100.54	105.48	103.85	104.32	103.48	104.44	103.26	103.77	105.44
25	104.42	102.26	101.69	100.42	105.56	103.84	104.13	103.40	104.59	103.44	103.65	105.33
26	104.52	*102.01	101.44	100.70	105.56	103.86	104.14	103.44	104.59	103.51	103.60	105.01
27	104.28	*101.32	101.34	101.54	*105.35	104.07	104.35	103.49	104.72	103.44	103.82	104.82
28	104.09	*100.96	101.50	101.61	*105.50	104.02	104.03	103.42	104.86	103.38	103.64	104.78
29	104.17		102.18	101.23	*105.64	104.05	103.77	103.66	104.50	103.32	103.64	104.55
30	104.22		103.06	101.01	105.79	104.13	103.41	103.87	104.27	103.37	104.09	104.43
31	104.46		102.70		105.69		103.02	104.26		103.30		104.75
Avg.	104.35	102.70	102.20	101.51	104.12	104.58	103.75	103.47	103.82	103.89	103.53	104.14

* Partly estimated

* Estimated

TWENTY-ONE MILE WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir on wasteway from West Main Canal to Colorado River. Located on east side of levee at site used prior to May 1, 1971. The site used May 1, 1971 to September 20, 1977 was located 200 feet (61 m) downstream from present site on west side of levee. This wasteway is located in Arizona, 18.5 miles (29.8 km) downstream from the northerly international boundary, 17.4 miles (28.0 km) downstream from Morelos Diversion Dam, and 2.2 miles (3.5 km) upstream from the southerly international boundary. It is the farthest downstream of the two wasteways discharging waste water from the Valley Division of the Yuma Project in the United States into the limnrophe section of the Colorado River. The elevation of the zero of the gage at the new location has not been determined.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through 1986, obtained by the United States Section; monthly discharge, March 1939 through 1950, by Bureau of Reclamation.

REMARKS: This wasteway was completed and flow began March 14, 1939. Since May 13, 1944, waste water from the West Main Canal which previously discharged across the southerly land boundary has been returned to the Colorado River through this wasteway. The West Main Canal Wasteway was completed in February of 1971, and the waste water from the West Main Canal is normally discharged across the southerly land boundary.

EXTREMES: Prior to January 1951, maximum monthly discharge 2,860 acre-feet (3,528,000 m³) in January 1946; minimum monthly discharge, 122 acre-feet (150,000 m³) in September 1950. Since January 1, 1951, maximum instantaneous discharge, 102 second-feet (2.89 m³/sec) on January 24, 1954, at a maximum gage height of 95.46 feet (29.10 m) (old datum); minimum instantaneous discharge, zero during a part of most months.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.1	10.3	0	0	0.2	5.5	7.4	0.6	0.3	0.1	12.3	27.2
2	0.1	17.5	0.1	0	0.2	7.8	2.4	0	0.3	0.1	17.6	1.7
3	0.1	21.0	0.1	0	0.2	8.3	0.5	0.9	0.3	0.1	25.6	0.1
4	0	1.8	0.1	0.1	0.1	14.4	7.4	7.6	0.2	0.1	2.3	1.1
5	0	0.4	0	0	0.1	7.7	9.7	0.1	0.2	0.2	0.3	5.6
6	0	0	0.1	0.1	0.1	3.8	9.8	0	0.3	0.2	0	7.1
7	0	0	0.1	0.1	0.1	0.6	11.9	0	0.2	0.1	6.5	3.3
8	0	0	0	0	0.1	2.4	14.7	0.2	0.2	0.1	12.6	5.6
9	0	0	0	0	0.1	2.7	7.0	0.3	0.2	0.2	28.7	0.2
10	0	0	0	0.1	0.1	12.4	7.1	0.3	0.3	0.2	8.4	0.2
11	0	0	0	0.1	0.1	9.0	0.2	1.4	0.2	0	12.2	2.4
12	0	0	0	0.1	0.1	5.7	1.8	3.0	0.2	0	18.8	19.1
13	0	9.6	0.1	0.1	0.1	9.7	0.4	2.4	0.4	0	4.3	2.6
14	0	3.0	0	0	0.1	4.7	3.7	11.5	0.4	0	5.6	1.1
15	0	3.2	0	0	0.2	2.0	6.6	0.1	0.2	0	7.9	4.8
16	0	1.4	2.4	0	0.2	0.1	0.2	0.1	0.3	0	17.4	11.4
17	0	2.8	2.4	0.1	0.1	4.1	0.2	4.4	0.4	0	16.7	13.4
18	0	1.8	2.1	0.1	0.2	4.0	0.2	5.8	0.3	0	7.4	3.1
19	0	0.2	2.0	0.2	12.2	14.8	0.2	5.3	0.2	0	10.8	0.5
20	0	0.2	0.2	0.1	2.1	3.9	2.3	3.7	0.2	0	9.7	12.1
21	0	0.2	0.1	0.1	0.4	9.4	2.5	6.2	0.3	0	3.7	11.0
22	0	0.2	0.1	0.1	0.2	10.7	3.5	7.8	0.4	0	4.1	11.5
23	0	0.2	0	0.1	0	7.3	1.3	6.8	0.3	0	7.8	4.9
24	0	0.2	0	0	0	2.6	0.3	1.6	0.2	0	11.1	9.5
25	0	0.2	0	0.1	0	12.5	2.3	1.1	0.3	2.9	12.1	21.1
26	0	0.1	0	0	0	1.5	5.0	1.2	0.2	1.9	3.5	11.5
27	0	0	0	0.1	0	0.3	0.1	0.3	0.2	1.4	7.0	10.7
28	0	0	0	0	0	1.5	8.1	0.2	0.2	1.3	6.9	10.3
29	0	0	0	0	0	2.6	12.5	0.3	0.2	1.9	6.2	0.9
30	0	0	0	0	1.4	7.1	4.6	0.4	0.1	2.9	17.2	1.2
31	0	0	0	0	1.9	0	0.7	0.3	0	6.1	0	5.2
Sum	0.3	74.3	9.9	1.7	20.6	179.1	134.6	73.9	7.7	19.8	304.7	220.4
Current Year 1986									Period 1939-1986			
Month	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Low			Average	Maximum	Minimum		
Jan.	.02	0	1	0.1	1.6	0	0	628	2,860	0		
Feb.	1.59	0	1	34.7	1.6	0	2.7	549	2,510	0		
Mar.	1.76	0	18	40.4	1.1	0	0.3	500	1,660	0		
Apr.	.04	0	19	0.2	1.1	0	0.1	537	1,940	0		
May	1.82	0	19	42.5	1.6	0	0.7	654	2,470	0		
June	2.60	.02	2	72.1	20	0.1	6.0	577	2,350	0		
July	2.56	.01	8	70.5	31	0	4.3	499	1,950	0		
Aug.	2.18	0	14	55.8	1.5	0	2.4	521	2,530	0		
Sept.	.17	.02	13	0.8	30	0.1	0.3	464	2,180	0		
Oct.	1.19	0	31	21.7	111	0	0.6	564	2,100	0		
Nov.	1.98	0	9	48.3	6	0	10.2	679	2,380	0		
Dec.	1.60	0	20	35.0	1.2	0	7.1	734	2,680	0		
	2.60	0		72.1	0	2.9	2,076	6,906	24,370	0		
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	0.79	0		2.04	0	0.08	2,561	8,518	30,060	0		

† And other days

EAST MAIN CANAL WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir located about 300 feet (91.4 m) north of the international boundary near San Luis, Arizona and 1.5 miles (2.4 km) east of the Colorado River. From September 28, 1977 to April 6, 1978, recorder moved west 100 feet (30.5 m) to a temporary bypass channel. On April 7, 1978 recorder was moved back to original site.

RECORDS: Wasteway discharges computed by United States Section of the Commission beginning November 1, 1953, from head on control weir as measured by water-stage recorder and weir ratings as determined by current meter measurements. Records available: October 1946 through 1986. Records of monthly discharges also are available for the periods January 1924 through June 1928, January 1932 through 1933, and April 1935 through September 1946.

REMARKS: Wasteway discharges from the East Main Canal comprise regulatory waste and drainage waters from the eastern half of the Valley Division of the Yuma Project and are considered as part of the volumes arriving at the limitrophe section of the Colorado River.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.5	4.4	1.0	11.6	13.8	4.7	3.0	2.6	9.1	23.9	3.2	2.4
2	8.3	3.7	0.4	16.6	10.0	3.0	3.7	0.8	9.9	5.0	5.9	4.2
3	2.7	9.9	3.5	14.1	6.2	1.0	5.6	0.2	16.4	1.9	19.2	5.4
4	2.8	6.6	3.5	6.9	12.6	0.3	1.2	2.6	6.8	3.9	7.5	18.8
5	2.0	7.5	3.6	4.7	7.8	1.1	1.5	4.1	14.6	10.9	12.4	14.8
6	5.4	5.9	8.1	2.4	11.2	10.5	1.5	0.6	2.2	12.4	16.7	8.0
7	8.3	2.8	7.2	1.6	3.5	15.2	0.9	0.4	7.9	11.1	16.7	2.5
8	4.8	2.2	5.1	2.8	3.3	11.8	0.6	0	14.2	14.9	13.1	13.2
9	4.2	0.6	5.4	0.7	2.8	4.0	2.9	7.5	3.4	14.5	2.6	6.3
10	5.9	4.7	7.1	0.2	25.0	4.0	3.1	5.7	4.1	11.9	16.4	6.2
11	3.4	3.3	2.0	0	10.9	4.7	7.0	3.1	20.9	11.6	5.5	16.5
12	6.4	7.1	4.3	8.7	13.8	3.6	5.9	1.4	8.7	10.7	9.4	10.5
13	4.3	4.1	5.9	15.6	14.9	18.7	1.7	3.0	5.3	1.2	10.4	19.1
14	4.3	3.7	7.5	22.6	15.2	19.4	1.0	9.3	7.9	0.6	16.9	12.9
15	1.1	1.5	4.9	10.4	6.8	7.3	6.6	4.4	13.3	5.7	11.2	10.4
16	0.7	5.1	4.9	8.9	1.3	6.4	1.5	2.8	15.1	5.5	15.7	3.0
17	0.9	14.1	4.9	6.3	10.9	5.7	2.2	5.9	2.1	1.0	9.3	3.1
18	0.6	8.8	4.0	15.7	6.8	5.4	1.5	8.9	1.2	1.8	5.6	2.4
19	1.2	8.6	3.5	14.5	11.8	4.3	0.9	3.4	6.5	3.6	7.1	12.8
20	3.2	4.2	1.9	9.1	3.0	8.1	1.1	2.2	11.3	0.7	5.7	7.5
21	3.2	5.2	3.7	17.8	0.5	11.8	0.5	6.5	11.5	8.9	19.3	6.0
22	2.3	3.6	3.4	4.8	0	5.1	2.3	0.9	16.5	1.5	27.7	8.5
23	5.6	8.2	4.0	3.4	0	2.0	11.8	5.2	11.6	4.6	8.1	2.1
24	8.7	14.2	6.2	2.5	0	2.4	5.1	6.9	4.3	9.1	13.7	3.0
25	2.9	4.6	2.7	3.6	0.7	5.3	2.5	6.3	10.0	11.5	11.3	2.2
26	2.1	2.3	0.9	5.5	2.6	3.2	4.7	5.1	8.3	1.3	10.2	2.6
27	2.5	1.9	10.4	9.6	7.3	6.2	3.4	3.1	18.1	0.8	10.8	2.1
28	10.4	2.8	8.5	6.9	5.0	6.0	1.0	3.8	12.9	6.4	14.5	0.5
29	15.3		2.8	11.9	12.3	4.3	2.7	0.7	4.3	3.5	15.3	2.8
30	17.1		7.5	16.7	16.3	1.7	7.7	2.9	6.9	0.7	6.9	2.4
31	8.9		12.7		11.7		5.7	3.6		8.6		4.7
Sum	156.0	151.6	151.5	256.1	248.0	187.2	100.8	113.9	285.3	209.7	348.3	216.9
Current Year 1986									Period 1935-1986			
Month	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Day			Low	Average	Maximum	Minimum	
Jan.	.78	.04	4	22.5	115	0.4	5.0	309	992	3,360	90.0	
Feb.	.88	.03	6	27.7	9	0.3	5.4	301	835	3,170	133	
Mar.	1.06	.01	3	37.2	3	0.1	4.9	300	958	2,920	154	
Apr.	1.25	0	16	47.8	110	0	8.5	508	937	3,170	175	
May	1.02	0	10	29.8	122	0	8.0	492	1,041	3,040	228	
June	.91	0	13	29.2	4	0	6.2	371	882	3,660	161	
July	.70	0	23	18.5	1	0	3.3	200	945	3,590	170	
Aug.	.90	0	18	28.7	1	0	3.7	226	966	3,170	159	
Sept.	1.13	.06	11	41.1	7	0.6	9.5	566	926	3,170	159	
Oct.	1.26	.04	31	48.4	21	0.4	6.8	416	966	3,280	307	
Nov.	1.22	.07	14	46.1	23	0.7	11.6	691	1,047	3,570	241	
Dec.	1.22	.03	9	46.1	13	0.3	7.0	430	1,007	3,080	240	
Yearly	1.26	0		48.4		0	6.6	4,810	11,502	38,310	3,026	
	Meters		Cubic Meters per Second					Thousands of Cubic Meters				
	0.38	0		1.37		0	0.19	5,933	14,187	47,255	3,733	

* Estimated

* Partly estimated

! And other days

YUMA MAIN DRAIN (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorders located in the forebay and afterbay, with flow meters in the four discharge pipes at the Boundary Pumping Plant on the Main Drain about 200 feet (61 m) north of the international boundary near San Luis, Arizona, 1.3 miles (2.1 km) east of the Colorado River.

RECORDS: Main Drain discharges are lifted 10 (3.05) to 12 feet (3.66 m) at the pumping plant. Prior to April 1, 1969, discharges were computed from pump ratings and the differential head measured by the two gages. Beginning April 1, 1969 discharges were computed from flow meter charts. Pump ratings and flow meter discharges are checked by current meter measurements. Records obtained and computed by the United States Section of the Commission. Records available: Monthly discharges, June 1919 through 1951; daily discharges January 1952 through 1986.

REMARKS: Flows in the Main Drain are principally drainage waters from the Valley Division of the Yuma Project. The Main Drain, the East Main Canal Wasteway, West Main Canal Wasteway, and 242 Lateral discharge into Mexico at the international land boundary near San Luis, Sonora. The water is used for irrigation in Mexico on the left (Sonora) bank of the Colorado River and is considered as part of the volumes arriving at the limitrophe section of the river.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	154	150	149	157	158	151	138	136	151	169	187	151
2	147	156	146	159	151	145	137	133	149	163	180	151
3	148	145	158	169	155	141	151	133	152	171	195	144
4	151	145	146	164	155	140	152	142	158	169	181	143
5	137	144	144	172	153	134	139	125	155	165	180	158
6	144	139	134	173	155	144	137	125	155	169	174	140
7	147	152	148	172	149	143	137	130	160	181	183	131
8	143	149	150	165	160	154	136	135	154	186	185	128
9	142	141	139	168	160	142	136	142	146	183	179	140
10	147	147	142	160	163	142	139	149	145	190	199	151
11	142	138	142	158	162	145	141	144	159	192	199	152
12	140	145	139	172	152	135	139	135	147	179	186	143
13	155	131	144	174	148	131	111	134	143	151	193	166
14	150	142	157	179	147	138	102	131	145	170	198	174
15	150	149	152	174	146	124	119	131	141	183	176	148
16	146	154	185	173	155	114	141	153	146	172	189	144
17	149	136	168	161	171	131	130	149	150	176	180	140
18	151	128	149	172	187	139	132	153	153	184	162	139
19	139	127	142	171	177	133	137	148	165	181	153	144
20	141	128	153	175	155	135	125	146	167	183	151	156
21	142	134	145	176	145	131	108	152	173	187	158	151
22	145	140	150	165	144	121	125	146	177	184	162	152
23	153	142	155	169	137	96.0	132	154	176	188	155	154
24	161	144	156	169	140	127	132	153	160	196	161	161
25	146	139	157	165	150	128	126	144	156	189	160	149
26	152	139	148	170	152	131	121	143	156	180	142	136
27	141	152	151	173	153	127	121	147	179	182	137	137
28	147	139	161	182	145	124	138	155	175	177	146	138
29	146		171	175	147	129	125	149	169	180	149	145
30	152		177	163	145	136	129	160	168	191	149	146
31	151		165		156		151	147		194		139
Sum	4,559	3,975	4,723	5,075	4,773	4,011.0	4,087	4,424	4,730	5,565	5,149	4,551
Current Year 1986									Period 1935-1986			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			24	161	5	137	147	9,043	7,588	11,203	1,740	
Feb.			2	156	19	127	142	7,884	7,432	11,988	1,640	
Mar.			16	185	6	134	152	9,368	8,551	12,430	1,940	
Apr.			28	182	1	157	169	10,066	8,421	11,890	1,920	
May			18	187	23	137	154	9,467	8,613	13,140	1,950	
June			8	154	23	96.0	134	7,956	8,004	12,040	2,290	
July			4	152	14	102	132	8,106	7,960	11,830	2,530	
Aug.			30	160	5	125	143	8,775	7,945	11,960	2,560	
Sept.			27	179	15	141	158	9,382	7,923	11,568	2,280	
Oct.			24	196	13	151	180	11,038	8,947	12,385	2,940	
Nov.			110	199	27	137	172	10,213	8,443	12,010	2,800	
Dec.			14	174	8	128	147	9,027	8,076	11,480	2,450	
Yearly				199		96.0	152	110,325	97,803	139,380	27,040	
Meters			Cubic Meters per Second				Thousands of Cubic Meters					
				5.64		2.72	4.30	136,084	120,638	171,922	33,353	

Ø Mean daily

! And other days

WEST MAIN CANAL WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder located about 0.3 mile (0.5 km) upstream from outlet to Yuma Main Drain, which is 175 feet (53.3 m) upstream from East Main Canal Wasteway outlet and 0.4 mile (0.6 km) west of San Luis, Arizona. Prior to August 1, 1975, the recorder was located about 150 feet (45.7 m) upstream from outlet to Yuma Main Drain.

RECORDS: Wasteway discharges computed by United States Section of the Commission beginning February 23, 1971, from water-stage recorder and ratings as determined by current meter measurements. Records available: February 23, 1971 through 1986.

REMARKS: Wasteway discharges from West Main Canal Wasteway comprise regulatory waste from the West Main Canal.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.4	4.5	3.5	7.3	3.8	2.9	0	0.1	8.7	7.5	3.6	0.9
2	15.3	1.5	0.4	4.2	7.1	0	1.0	1.7	8.7	1.3	0.1	0.2
3	6.1	2.2	14.1	14.1	0.4	0	1.9	2.8	8.7	3.1	0	0.2
4	7.6	0.4	2.4	13.6	5.6	0	0.1	6.0	2.9	2.8	0	0.2
5	16.9	0.1	0.3	8.0	3.3	1.1	0.9	1.2	5.3	13.4	0	0.2
6	19.8	0.6	1.4	6.1	0.5	1.6	1.3	0.4	15.0	12.7	0	0.7
7	8.9	2.0	5.0	22.2	0.7	0.6	0.2	0.1	4.6	4.7	0	0
8	6.2	1.2	0.9	2.4	5.0	0.7	0.2	0	8.2	2.3	0	1.0
9	7.2	6.0	0.9	0.7	4.2	0.9	0	0	8.4	2.8	0	1.1
10	1.1	8.7	3.8	0.4	6.8	1.2	1.3	0	8.0	10.9	0	0
11	2.1	1.5	12.3	4.2	13.1	1.5	3.5	0	3.1	6.0	0	1.0
12	2.0	0.4	10.6	1.3	9.6	2.1	0.9	0	3.6	4.0	0	0.1
13	5.7	3.2	4.1	1.0	12.4	0	0.1	0.2	11.5	2.6	0.2	0.1
14	4.5	0.2	13.9	0.7	15.2	0	0	1.3	10.4	2.9	2.0	3.2
15	1.3	0.2	9.9	0.1	10.1	0.6	0	3.8	4.4	2.4	0	2.8
16	4.6	0.3	9.2	0.1	5.8	1.5	0	1.1	9.5	0.6	0	0.4
17	11.7	0	1.2	4.1	20.6	0.6	0	0.5	3.9	0.8	0.8	0.2
18	13.8	0.4	1.0	2.5	28.1	0	0.6	0.1	5.4	1.8	0.7	0
19	17.4	2.4	3.4	3.2	23.2	0.1	0	0	5.3	7.4	0.1	0
20	13.9	11.7	5.2	0.8	0.4	0.3	1.0	0	6.5	3.1	0.1	0.8
21	7.6	5.7	3.6	3.0	0.1	1.0	0.1	0	10.9	1.7	0.1	0
22	3.3	1.7	0.4	11.8	0	0	0.5	0	10.0	1.1	1.0	0
23	6.6	2.9	4.4	5.6	0	0	1.3	1.1	10.1	0.7	0.3	0
24	3.9	5.7	1.7	3.9	2.7	1.9	1.3	1.2	6.7	0.5	0	0
25	4.6	3.4	1.5	5.8	19.1	1.9	0.1	3.6	9.8	0.2	0.1	0
26	0.8	3.4	0.2	10.7	4.6	0.8	0.2	0.4	8.1	1.4	0.6	0
27	4.3	7.4	1.9	14.4	4.8	0.2	1.4	0.3	10.0	1.4	1.5	0
28	6.2	2.7	3.2	11.2	0.1	0.5	3.7	1.2	13.1	0.3	1.5	0
29	7.1		8.1	5.3	2.6	0.6	4.3	1.9	8.4	0.5	0.3	0
30	4.0		15.2	0.7	3.0	0.2	0.3	11.8	0.8	0.2	0.2	0
31	5.4		4.6		0.5		5.4	9.0		1.8		4.7
Sum	220.3	80.4	148.3	169.4	213.4	22.8	31.6	49.8	230.0	102.9	13.2	17.8
Current Year 1986									Period 1971-1986			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	2.04	.02	18	33.9	126	0.1	7.1	437	352	565	125	
Feb.	2.00	0	20	32.7	117	0	2.9	159	412	681	159	
Mar.	2.07	.01	14	34.9	15	0	4.8	294	453	939	203	
Apr.	2.29	0	7	42.0	113	0	5.6	336	350	664	164	
May	2.39	0	19	45.4	17	0	6.9	423	304	434	148	
June	1.51	0	24	18.8	12	0	0.8	45.2	278	480	45.2	
July	1.66	0	3	22.6	11	0	1.0	62.7	279	556	62.7	
Aug.	1.90	0	30	29.7	11	0	1.6	98.8	291	536	98.0	
Sept.	1.92	.04	6	30.3	117	0.2	7.7	456	371	768	190	
Oct.	1.84	.02	5	27.9	18	0.1	3.3	204	358	728	133	
Nov.	1.38	0	14	16.2	12	0	0.4	26.2	334	541	26.2	
Dec.	1.66	0	31	22.6	17	0	0.6	35.3	340	610	35.3	
Yearly	2.39	0		45.4		0	3.6	2,577	4,122	6,229	2,577	
	Meters Cubic Meters per Second Thousands of Cubic Meters											
	.73	0		1.29		0	0.10	3,179	5,084	7,683	3,179	

* Partly estimated

! And other days

242 WELL FIELD NEAR SAN LUIS, ARIZONA

DESCRIPTION: Water-stage recorder and 12-foot (3.7 m) Parshall flume located 100 feet (30.5 m) upstream from confluence of East Main Canal Wasteway, 110 feet (33.5 m) north of the southerly land boundary, and 1.4 miles (2.3 km) east of the Colorado River.

RECORDS: Based on current meter measurements and a continuous record of gage heights. The station is operated by the United States Section of the Commission. Records available: October 18, 1978 through 1986.

REMARKS: Records show the pumping of ground water from the 242 well field east of San Luis, Arizona.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Mean Daily Discharge in Seconds Feet 1986												
Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	4.8	8.4	3.2	3.4	12.3	4.7	4.0	5.3	3.2	6.5
2	0	0	0	7.4	2.6	5.1	19.6	3.6	3.8	5.3	4.1	5.7
3	0	0	3.7	6.8	2.7	4.2	13.4	7.1	4.6	3.5	2.6	7.2
4	0	0	6.2	6.8	4.4	5.0	13.3	7.0	3.7	3.2	0.3	7.2
5	0	0	4.4	6.9	4.6	3.6	7.7	6.9	3.7	3.6	0.4	7.2
6	0	0	1.2	6.8	3.3	5.1	3.1	4.0	4.1	3.3	8.8	4.4
7	0	0	4.0	6.9	5.0	2.9	3.6	3.6	3.8	3.4	22.9	0.3
8	0	0	0.2	6.3	4.8	4.2	3.5	4.0	3.5	3.3	28.5	0
9	0	0	0	1.3	5.4	3.2	2.6	3.9	7.9	3.4	28.5	0
10	0	0	0.6	5.6	3.7	5.0	2.5	3.3	9.7	3.2	13.5	0
11	0	0	4.0	2.0	4.9	4.3	2.5	3.5	6.5	5.4	0.2	2.5
12	0	0	0.2	4.8	4.6	5.1	2.2	5.0	3.8	3.8	2.3	7.0
13	0	0	1.4	3.6	3.4	5.3	2.5	3.2	3.8	4.0	5.5	4.7
14	0	1.1	4.8	6.8	4.5	4.5	3.4	4.6	4.7	4.1	4.5	0.3
15	0	5.6	0.3	3.2	3.3	4.1	3.3	2.9	4.0	3.5	4.9	0
16	0	5.8	0	1.3	3.8	4.0	3.2	5.4	4.6	3.6	9.0	0
17	0	0.4	0	4.2	2.5	2.4	4.2	3.8	6.6	3.2	7.0	0.5
18	0	0	0	2.2	4.5	3.0	6.1	4.5	5.4	5.3	7.1	3.4
19	0	0	0	2.1	3.7	3.1	2.9	5.2	5.6	3.3	5.0	4.0
20	0	0	2.3	1.9	2.9	3.8	2.8	4.5	7.3	3.5	7.0	3.5
21	0	0	4.0	1.0	2.9	3.0	5.3	3.1	9.4	3.0	4.1	3.4
22	0	0	0.4	2.1	4.7	5.2	3.9	2.9	9.4	3.3	0.4	7.4
23	0	0	0	1.7	3.8	0.4	3.3	1.8	6.3	4.6	0	6.4
24	0	0	20.7	4.0	3.0	2.5	6.5	3.6	0.7	3.7	4.3	4.3
25	0	0	26.9	2.2	4.1	4.2	5.4	4.8	2.5	4.3	6.2	3.6
26	0	0	11.7	1.8	3.3	3.7	7.3	5.0	4.4	3.5	0.3	3.9
27	0	0	7.0	1.2	4.1	4.7	5.1	4.1	4.0	5.1	0	3.7
28	0	2.7	7.5	1.3	3.7	3.1	3.2	2.3	4.3	4.6	0	2.9
29	0	0	8.7	1.4	5.1	2.9	4.6	5.1	5.7	6.8	0	5.0
30	0	0	8.8	1.6	6.4	3.2	5.2	5.4	3.7	6.5	0.3	0.2
31	0	0	9.2	0	4.5	0	4.8	4.4	0	3.2	0	0
Sum	0	15.6	143.0	113.6	123.4	114.2	169.3	133.2	151.5	125.8	180.9	105.2
Current Year 1986									Period 1979-1986			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Low	Day			Average	Maximum	Minimum	
Jan.	0	0	1	0	1	0	0	0	443	2,761	0	
Feb.	.37	0	15	9.7	1	0	0.6	30.9	510	2,257	0	
Mar.	.97	0	25	44.1	1	0	4.6	284	412	2,132	0	
Apr.	.40	0	15	10.8	1	0	3.8	225	476	2,681	0	
May	.42	.02	30	11.6	2	0.4	4.0	245	834	2,750	11.3	
June	.34	0	3	8.7	123	0	3.8	227	793	2,800	21.4	
July	.72	.05	2	27.1	1	1.1	5.5	336	830	3,020	16.3	
Aug.	.35	.01	1	9.0	23	0.2	4.3	264	610	2,073	0	
Sept.	.51	0	9	15.4	124	0	5.1	300	751	2,326	0	
Oct.	.49	.07	30	14.5	7	1.6	4.1	250	603	2,711	0	
Nov.	.75	0	8	29.2	1	4	6.0	359	227	1,011	0	
Dec.	.34	0	3	8.7	1	7	0	209	542	2,962	0	
Yearly	.97	0		44.1	0		3.8	2,730	7,031	23,566	163	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	0.30	0		1.25	0	0.11	3,367	8,673	29,068	201		

! And other days

TOTAL FLOWS CROSSING INTERNATIONAL BOUNDARY
INTO MEXICO NEAR SAN LUIS, SONORA

DESCRIPTION: The tabulated data below are the combined flows of the East Main Canal Wasteway, West Main Canal Wasteway, 242 Lateral, and the Yuma Main Drain and represent the total water crossing the international land boundary into the Sanchez Mejorada Canal near San Luis, Arizona.

RECORDS: Records obtained and computed by the United States Section of the Commission. Records available: February 23, 1971 through 1986; 242 Lateral from November 1978 through 1986.

REMARKS: Descriptions and flows of the individual stations, East Main Canal Wasteway, West Main Canal Wasteway, the Yuma Main Drain, and 242 Lateral are published separately in this bulletin on pages 26, 28, 27, and 29.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	161	159	158	184	179	162	153	143	173	206	197	161
2	171	161	147	187	171	153	161	139	171	175	190	161
3	157	157	179	204	164	146	172	143	182	180	217	157
4	161	152	158	191	178	145	167	158	171	179	189	169
5	156	152	152	192	169	140	149	137	179	193	193	180
6	169	146	145	188	170	161	143	130	176	197	200	153
7	164	157	164	203	158	162	142	134	176	200	223	134
8	154	152	156	176	173	171	140	139	180	206	227	142
9	153	148	145	171	172	150	142	153	166	204	210	147
10	154	160	154	166	198	152	146	158	167	216	229	157
11	148	143	160	164	191	156	154	151	190	215	205	172
12	148	152	154	187	180	146	148	141	163	198	198	161
13	165	138	155	194	179	155	115	140	164	159	209	190
14	159	147	183	209	182	162	106	146	168	178	221	190
15	152	156	167	188	166	136	129	142	163	195	192	161
16	151	165	199	183	166	126	146	162	175	182	214	147
17	162	150	174	176	205	140	136	159	163	181	197	144
18	165	137	154	192	226	147	140	166	165	193	175	145
19	158	138	149	191	216	140	141	157	182	195	165	161
20	158	144	162	187	161	147	130	153	192	190	164	168
21	153	145	156	198	148	147	114	162	205	201	182	160
22	151	145	154	184	149	131	132	150	213	190	191	168
23	165	153	163	180	141	98.4	148	162	204	198	163	162
24	174	164	185	179	146	134	145	165	172	209	179	168
25	154	147	188	177	174	139	134	159	178	205	178	155
26	155	145	161	188	162	139	133	154	177	186	153	142
27	148	161	170	198	169	138	131	154	211	189	149	143
28	164	147	180	201	154	134	146	162	205	188	162	141
29	168		191	194	167	137	137	157	187	191	165	153
30	173		208	182	171	141	142	180	179	198	156	149
31	165		192		173		167	164		208		148
Sum	4,936	4,221	5,163	5,614	5,358	4,335.4	4,389	4,720	5,397	6,005	5,693	4,889
Current Year 1986									Period 1935-1986			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			24	174	11	148	159	9,789	9,375	12,131	2,123	
Feb.			16	165	18	137	151	8,375	9,189	12,970	2,023	
Mar.			30	208	1	145	167	10,246	10,374	13,704	2,322	
Apr.			14	209	11	164	187	11,135	10,184	12,982	2,117	
May			18	226	23	141	173	10,627	10,792	13,900	2,473	
June			8	171	23	98.4	145	8,599	9,957	12,570	2,525	
July			3	172	14	106	142	8,705	10,014	12,420	2,927	
Aug.			30	180	6	130	152	9,364	9,812	12,657	2,989	
Sept.			22	213	112	163	180	10,704	9,971	12,850	2,602	
Oct.			10	216	13	159	194	11,908	10,774	13,898	3,444	
Nov.			10	229	27	149	190	11,289	10,051	12,712	3,407	
Dec.			113	190	7	134	158	9,701	9,965	12,050	2,888	
Yearly			229		98.4		166	120,442	120,458	149,010	31,840	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
			6.49		2.79		4.70	148,563	148,583	183,802	39,274	

0 Mean daily

* Partly estimated

! And other days

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - DISCHARGES

DESCRIPTION: Water-stage recorder was located in Mexico on the right bank of the river about 1,000 feet (305 m) upstream from the southerly international boundary, 2 miles (3.2 km) west of San Luis, Arizona, and 21.9 miles (35.2 km) downstream from Morelos Dam. The zero of the gage was at mean sea level, U. S. C. & G. S. datum. This gage was destroyed on January 19, 1983. Between January 19, 1983 and December 10, 1985, temporary gages were installed on the United States side and levels were established to ensure continuous record. On December 10, 1985 a permanent water-stage recorder was relocated on the left bank of the river about 80 feet (24.4 m) upstream from the southerly international boundary.

RECORDS: Records obtained and furnished by the United States Section of the Commission. Computations by shifting control methods. Records available: Daily discharges, January 1950 through 1986; continuous record of gage heights, January 1947 through 1986. Monthly flows for this station have been derived for the period January 1935 through 1949 based on the computed records of monthly flows of the Colorado River at the northerly international boundary combined with the measured monthly flows from the wasteways discharging into the boundary section of the river from the Yuma Project in Arizona.

REMARKS: Reservoirs, diversions in the United States and Mexico, drainage returns, and waste flows modify the river flow at this station.

EXTREMES: Since January 1950: Maximum instantaneous discharge, 33,100 second-feet (937 m³/sec) on August 19, 1983; maximum gage height, 84.84 feet (25.86 m) on November 29, 1957. Minimum discharge, no flow on several occasions since September 1, 1956.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	14,500	14,100	8,420	9,580	6,230	21,100	12,000	8,800	12,400	12,300	9,680	11,400
2	14,400	14,600	8,380	9,280	6,580	21,100	12,300	8,820	11,300	12,700	10,100	10,700
3	14,200	14,500	8,270	9,150	7,250	19,900	12,700	9,800	11,000	12,300	9,910	10,600
4	14,500	12,500	8,420	9,330	7,820	20,200	13,100	9,870	10,400	12,400	8,610	10,600
5	15,200	10,500	8,230	9,950	8,330	19,000	13,000	8,900	9,970	12,600	8,990	10,500
6	15,500	8,120	8,240	10,300	7,390	19,000	13,600	8,580	9,270	12,800	9,280	10,800
7	15,500	5,430	8,260	10,600	7,460	18,900	13,000	8,450	9,510	12,600	8,900	10,800
8	15,300	5,600	8,410	9,580	8,230	17,900	11,500	7,990	10,000	12,800	9,130	11,300
9	14,900	9,410	7,300	9,350	9,220	15,500	11,100	8,310	8,860	11,500	9,880	10,300
10	14,100	11,200	8,790	8,160	11,700	13,700	11,000	9,470	8,500	12,900	10,600	10,500
11	14,100	12,000	8,660	7,740	14,100	13,400	10,700	10,000	8,160	14,000	9,580	10,600
12	14,200	11,700	9,100	7,710	13,800	13,600	11,000	9,550	8,680	13,400	9,210	10,500
13	13,900	11,500	8,660	8,150	12,700	13,500	11,700	10,600	9,000	12,000	9,320	10,700
14	13,900	11,600	8,880	7,950	12,600	13,900	11,900	9,950	9,880	10,400	9,550	11,300
15	13,600	11,800	10,200	6,510	13,700	14,700	10,800	9,620	10,200	10,000	10,000	12,200
16	13,300	12,300	11,200	6,980	15,800	13,900	10,900	10,300	9,420	10,000	9,970	11,400
17	12,700	12,100	11,100	6,030	17,100	12,600	11,300	11,500	10,200	10,000	10,300	11,800
18	11,800	11,400	10,600	5,340	19,000	11,800	11,300	11,700	10,700	10,100	10,400	11,500
19	12,000	11,400	10,400	5,690	19,800	11,500	11,600	11,500	11,100	9,830	11,700	11,700
20	12,500	11,100	10,000	6,790	19,200	11,800	12,100	11,100	11,200	9,470	11,400	11,200
21	12,600	10,700	9,720	7,080	19,100	12,800	11,700	10,600	11,300	8,290	11,200	12,500
22	13,000	10,500	10,100	5,820	18,900	13,600	11,000	11,100	11,400	8,790	11,900	13,700
23	13,200	10,900	10,400	5,750	19,000	12,700	12,800	11,200	11,100	8,590	12,100	13,900
24	13,200	11,200	9,780	5,510	18,800	11,400	13,900	10,100	12,000	8,560	11,500	16,200
25	13,600	10,500	8,320	5,090	19,200	11,500	13,000	10,100	12,700	9,060	10,900	17,500
26	13,900	10,000	7,870	5,380	19,500	11,800	12,400	9,440	12,700	9,350	10,500	16,600
27	13,600	9,500	7,580	6,620	19,300	12,400	13,000	9,630	13,500	9,440	11,000	16,000
28	12,700	8,780	7,690	7,900	19,300	12,500	12,900	9,490	13,800	9,450	11,000	16,300
29	13,000		9,130	7,140	19,300	12,600	11,700	9,790	13,500	9,210	10,400	15,800
30	13,100		10,700	6,070	19,500	13,100	10,600	10,700	12,300	9,740	11,300	15,200
31	13,500		10,700		19,500		9,140	12,100		9,580		16,400
Sum	425,500	304,940	283,510	226,530	449,410	441,400	368,740	309,060	324,050	334,160	308,310	390,500
Current Year 1986												
Period 1935-1986												
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	79.02	78.29	1	15,700	18	11,400	13,700	843,967	376,472	1,672,000	0	
Feb.	79.41	76.37	3	15,600	17	4,770	10,900	604,840	308,780	1,385,000	0	
Mar.	79.10	77.65	16	11,400	127	7,300	9,150	562,334	251,374	1,127,000	798	
Apr.	78.85	76.83	7	10,900	25	5,000	7,550	449,316	170,107	758,202	0	
May	80.09	77.37	19	20,600	1	6,030	14,500	891,392	240,084	1,160,000	0	
June	80.11	78.81	1	22,500	124	11,300	14,700	875,504	210,040	1,180,000	0	
July	79.70	78.67	123	14,300	31	8,950	11,900	731,385	182,746	1,477,091	0	
Aug.	79.39	78.34	31	13,000	8	7,900	9,970	613,012	195,823	1,705,190	0	
Sept.	79.41	78.32	29	14,300	11	8,090	10,800	642,744	218,704	1,586,380	0	
Oct.	79.19	78.02	11	14,500	21	8,120	10,800	662,797	259,041	1,738,909	0	
Nov.	78.81	78.07	24	12,500	4	7,960	10,300	611,524	302,345	1,428,000	0	
Dec.	79.18	77.89	25	17,800	4	10,100	12,600	774,545	368,114	1,839,000	0	
Yearly	80.11	76.37		22,500		4,770	11,400	8,263,360	3,083,590	12,692,946	9,570	
	Meters		Cubic Meters per Second					Thousands of Cubic Meters				
	24.42	23.28		637		135	323	10,192,689	3,803,547	15,656,495	11,804	

* Estimated

* Partly estimated

! And other days

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - STAGES

(See preceding Page for Description)

MEAN DAILY GAGE HEIGHT IN FEET 1986

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	78.93	79.02	77.69	78.36	77.44	79.96	79.12	78.61	79.30	78.93	78.44	78.51
2	78.85	79.17	77.99	78.30	77.56	79.93	79.18	78.62	79.12	78.98	78.54	78.38
3	78.74	79.14	78.27	78.26	77.78	79.76	79.27	78.82	79.06	78.91	78.53	78.37
4	78.81	78.67	78.00	78.32	77.96	79.80	79.38	78.84	78.95	78.91	78.25	78.35
5	78.92	78.15	78.18	78.55	78.18	79.66	79.39	78.63	78.86	78.94	78.37	78.28
6	78.96	77.52	78.25	78.66	77.82	79.67	79.50	78.54	78.71	78.95	78.46	78.28
7	78.95	76.68	78.13	78.75	77.84	79.67	79.41	78.50	78.74	78.90	78.37	78.24
8	78.92	76.74	78.32	78.48	78.07	79.54	79.16	78.37	78.81	78.92	78.42	78.27
9	78.87	77.97	78.73	78.41	78.36	79.20	79.09	78.45	78.53	78.70	78.60	78.01
10	78.71	78.48	78.56	78.03	78.93	78.92	79.08	78.74	78.44	78.93	78.68	78.00
11	78.76	78.68	78.51	77.87	79.41	78.86	79.01	78.85	78.34	79.11	78.35	77.97
12	78.79	78.62	78.67	77.86	79.32	78.91	79.06	78.74	78.48	79.02	78.25	77.92
13	78.76	78.55	78.51	77.99	79.10	78.93	79.20	78.96	78.56	78.80	78.30	77.90
14	78.78	78.60	78.59	77.92	79.10	79.06	79.23	78.82	78.75	78.52	78.39	77.97
15	78.73	78.63	78.92	77.45	79.30	79.27	79.03	78.75	78.80	78.45	78.50	78.12
16	78.69	78.77	79.07	77.60	79.63	79.20	79.06	78.88	78.62	78.45	78.49	78.00
17	78.57	78.74	78.91	77.26	79.83	79.02	79.13	79.10	78.74	78.45	78.56	78.12
18	78.38	78.54	78.71	76.99	79.98	78.89	79.12	79.13	78.82	78.46	78.52	78.13
19	78.45	78.53	78.62	77.14	79.90	78.84	79.18	79.09	78.86	78.41	78.70	78.22
20	78.58	78.45	78.51	77.54	79.72	78.91	79.26	79.02	78.86	78.34	78.63	78.13
21	78.60	78.34	78.42	77.63	79.69	79.11	79.20	78.94	78.86	78.07	78.58	78.38
22	78.70	78.29	78.54	77.20	79.66	79.26	79.07	79.04	78.84	78.20	78.65	78.58
23	78.77	78.41	78.65	77.17	79.68	79.14	79.42	79.06	78.76	78.16	78.65	78.62
24	78.76	78.49	78.44	77.07	79.64	78.91	79.64	78.85	78.92	78.15	78.52	78.97
25	78.86	78.28	78.01	76.87	79.71	78.93	79.51	78.85	79.03	78.27	78.39	79.14
26	* 78.94	78.15	77.88	77.01	79.79	78.97	79.40	78.72	79.02	78.35	78.33	79.00
27	* 78.87	78.00	77.79	77.47	79.74	79.08	79.51	78.77	79.13	78.37	78.42	78.90
28	* 78.63	77.80	77.82	77.90	79.74	79.12	79.50	78.74	79.18	78.37	78.43	78.94
29	78.70		78.25	77.69	79.74	79.16	79.29	78.81	79.14	78.32	78.33	78.84
30	78.74		78.76	77.38	79.78	79.27	79.09	79.00	78.95	78.43	78.50	78.70
31	78.84		78.75		79.79		78.72	79.24		78.40		78.84
Avg.	78.76	78.34	78.40	77.77	79.10	79.23	79.23	78.82	78.84	78.59	78.47	78.39

* Partly estimated

* Estimated

WELLTON-MOHAWK BYPASS DRAIN AT SOUTHERLY INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder and Parshall flume located 80 feet (24.4 m) upstream from the southerly land boundary, 550 feet (168 m) east of the Colorado River, and 1.8 miles (2.9 km) west of San Luis, Arizona. The zero of the gage has not been determined.

RECORDS: Based on current meter measurements and a continuous record of gage heights. Station is operated by United States Section of the Commission. Records available: June 23, 1977 through 1986.

REMARKS: Pursuant to Minute No. 242 of the Commission, a bypass drain of the Wellton-Mohawk extension channel was constructed from Morelos Dam to the Santa Clara Slough in Mexico along the left bank of the Colorado River.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	172	167	30.5	182	23.8	189	155	141	151	194	174	199
2	172	167	33.5	181	26.6	191	142	149	154	194	171	198
3	169	171	31.7	180	25.7	196	151	147	155	193	175	196
4	168	171	51.3	178	53.2	194	154	146	160	191	174	193
5	171	178	80.7	176	36.9	178	153	146	158	183	176	194
6	170	174	128	180	21.4	162	153	146	158	185	174	202
7	169	172	167	178	50.4	159	154	146	154	188	174	202
8	169	177	167	171	26.2	154	154	146	154	187	173	193
9	169	177	171	165	41.3	155	153	149	153	189	167	200
10	168	179	174	165	40.1	150	156	161	156	194	167	200
11	169	177	177	167	33.8	148	154	151	153	183	172	204
12	171	169	178	176	31.1	146	154	148	156	180	174	204
13	171	161	177	174	35.3	152	156	147	160	174	172	206
14	171	119	176	172	42.2	149	158	153	160	174	172	208
15	169	158	174	181	49.0	153	158	153	155	173	171	206
16	165	161	174	187	50.0	148	159	153	153	174	171	174
17	166	165	175	181	50.0	148	156	153	153	174	171	202
18	167	139	174	180	49.5	148	156	153	151	174	173	208
19	169	99.0	174	178	38.8	148	152	151	144	176	169	208
20	166	48.4	174	169	51.2	148	134	150	142	176	181	207
21	164	57.2	176	87.8	37.4	148	131	145	144	174	194	208
22	165	66.4	178	130	35.6	148	119	147	142	174	200	204
23	172	41.9	178	54.4	35.0	148	122	149	146	174	198	199
24	172	51.4	178	63.5	54.2	144	117	153	146	174	194	202
25	171	32.0	178	22.9	74.1	142	115	153	149	171	194	202
26	166	23.9	180	21.1	188	141	129	154	147	169	202	208
27	165	36.6	181	23.6	172	142	124	172	155	167	204	214
28	170	38.1	181	22.2	185	144	124	168	186	168	204	224
29	177		187	21.4	192	150	122	146	193	192	202	220
30	172		189	22.2	189	156	136	146	193	186	200	222
31	168		185		193		139	149		180		220
Sum	5,243	3,476.9	4,778.7	3,990.1	2,131.8	4,679	4,440	4,671	4,681	5,585	5,443	6,327
Current Year 1986									Period 1977-1986			
Month	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Low			Average	Maximum	Minimum		
Jan.	1.74	1.63	29	183	116	163	169	10,399	12,745	17,542	9,241	
Feb.	2.02	.16	15	238	26	6.5	124	6,896	11,551	14,896	6,896	
Mar.	1.84	.20	6	202	1	9.0	154	9,478	13,329	17,427	9,478	
Apr.	1.85	.27	22	204	25	8.5	133	7,914	13,037	16,711	7,914	
May	1.88	.23	26	220	6	6.0	68.8	4,228	13,142	16,808	4,228	
June	1.77	1.49	13	198	26	139	156	9,281	12,538	16,086	9,281	
July	1.63	1.29	16	167	25	110	143	8,807	12,951	18,026	8,807	
Aug.	1.80	1.46	127	198	1	137	151	9,265	13,368	18,196	9,084	
Sept.	1.81	1.45	30	204	19	139	156	9,285	12,382	19,083	6,780	
Oct.	1.85	1.63	29	208	125	167	180	11,078	13,110	19,133	6,343	
Nov.	1.85	1.61	27	208	9	163	181	10,796	12,175	16,980	6,047	
Dec.	1.94	1.44	28	226	16	134	204	12,549	12,480	18,256	6,216	
Yearly	2.02	.16		238		6.0	152	109,976	152,808	180,374	109,976	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	0.62	0.05		6.74		0.17	4.30	135,653	188,486	222,488	135,653	

■ Estimated

■ Partly estimated

! And other days

WASTEWAY TO COLORADO RIVER AT KILOMETER 27 IN MEXICO

DESCRIPTION: Water-stage recorder and cableway located on the left bank of the canal wasteway immediately upstream from where it discharges into the Colorado River, 0.6 mile (1.0 km) downstream from the wasteway gates on the Central Feeder Canal on the right bank of the Colorado River, 16.8 miles (27.0 km) downstream from Morelos Dam, and 820 feet (250 m) south of the junction of the Mexicali-San Luis and Algodones-Pescaderos highways.

RECORDS: Data obtained and computed by the Colorado River Irrigation District of the Ministry of Agriculture and Hydraulic Resources and furnished by the Mexican Section of the Commission. Records shown in table below are waste returns to the Colorado River. Records available: April 1956 through 1986.

REMARKS: The Colorado River Irrigation District transports water for irrigation of land on the left bank of the Colorado River by the Central Feeder Canal to a point called Kilometer 27. At this point, flows may be returned to the river through the wasteway or diverted to the Bacanora-Monumentos Canal system through the Sanchez Mejorada Siphon, which was placed in operation on June 28, 1963. As part of the rehabilitation works, started in 1968, of the Colorado River Irrigation District, the Canal de Conexión was enlarged and lined, and is now known as the Central Feeder Canal.

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1986	Period 1956-1986		
		Average	Maximum	Minimum
January	59,167	10,945	69,527	0
February	41,264	5,095	41,264	0
March	58,411	7,835	58,411	0
April	69,212	13,556	69,212	0
May	80,727	12,720	80,727	0
June	29,514	10,872	50,025	0
July	0	12,491	46,139	0
August	0	16,677	107,162	0
September	0	13,532	68,053	0
October	0	12,434	110,417	0
November	0	11,626	99,044	0
December	0	10,236	70,213	0
Yearly	338,295	133,102	509,407	0
	Thousands of Cubic Meters			
	417,282	164,179	628,347	0

WASTEWAY TO COLORADO RIVER AT KILOMETER 38 IN MEXICO

DESCRIPTION: Wasteway to the Colorado River on the left bank of new Barrote Canal at old dam and bridge at Kilometer 18+251 (old Kilometer 38+000). The wasteway is located in the Colonia Bojorquez 0.8 mile (1.3 km) upstream from the Sonora-Baja California railroad bridge, 3.7 miles (5.9 km) downstream from the Miguel C. Rodriguez gaging station, and 28.1 miles (45.3 km) downstream from the southerly international boundary.

RECORDS: The records are computed by the Ministry of Agriculture and Hydraulic Resources and based upon gate openings. Records available: January 1964 through 1986.

REMARKS: The wasteway structure on the left bank of the Colorado River has two manually operated radial gates 9.8 feet (3.0 m) wide. It discharges into a dirt canal 656 feet (200 m) long with a total capacity of 459 second-feet (13.0 m³/sec) which discharges to the river.

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1986	Period 1964-1986		
		Average	Maximum	Minimum
January	2,362	1,650	8,546	0
February	3,047	1,413	9,757	0
March	2,648	722	4,809	0
April	4,503	400	4,503	0
May	8,821	1,374	11,549	0
June	2,598	837	6,960	0
July	3,180	728	7,389	0
August	2,951	1,149	14,402	0
September	13,665	2,119	13,665	0
October	17,312	4,388	23,242	0
November	8,815	2,746	20,481	0
December	10,023	2,365	10,847	0
Yearly	79,923	19,891	83,688	0
	Thousands of Cubic Meters			
	98,584	24,535	103,228	0

STORED WATER IN LARGE RESERVOIRS OF THE COLORADO RIVER

Data are presented below for all large storage reservoirs in the Colorado River basin below Lee's Ferry, all of which are located in the United States. The monthly figures represent usable contents on the last day of the month, in thousands of acre-feet. The capacities indicated are usable capacities at the top of the spillway gates in closed position for those dams having controlled spillways; for all others, capacities indicated are at spillway level. Records furnished by the U.S. Geological Survey.

IN THOUSANDS OF ACRE-FEET

Month	LAKE MEAD (Capacity 26,159.0)		LAKE MOHAVE (Capacity 1,810.0)		HAVASU LAKE (Capacity 619.4)		TOTAL IN UNITED STATES RESERVOIRS (Capacity 28,588.4)	
	1986	Average 1935-1986	1986	Average 1951-1986	1986	Average 1939-1986	1986	Estimated Average
Jan.	23,147	18,019	1,647	1,658	572.2	553.8	25,366.2	20,230.8
Feb.	23,313	17,837	1,581	1,673	569.2	556.1	25,463.2	20,066.1
Mar.	23,273	17,586	1,665	1,674	558.8	570.2	25,496.8	19,830.2
Apr.	23,616	17,661	1,601	1,668	589.5	600.1	25,806.5	19,929.1
May	24,120	18,438	1,676	1,727	574.5	602.6	26,370.5	20,767.6
June	24,416	19,559	1,668	1,632	538.2	600.5	26,622.2	21,791.5
July	23,967	19,723	1,571	1,513	590.8	590.4	26,128.8	21,826.4
Aug.	24,024	19,524	1,448	1,462	578.9	574.3	26,050.9	21,560.3
Sept.	24,220	19,290	1,395	1,432	577.5	569.8	26,192.5	21,291.8
Oct.	24,201	19,069	1,455	1,443	544.9	569.0	26,200.9	21,081.0
Nov.	24,362	18,897	1,422	1,512	549.5	560.0	26,333.5	20,969.0
Dec.	24,456	18,702	1,524	1,597	593.0	557.3	26,573.0	20,856.3
Avg.	23,926	18,692	1,554	1,583	569.8	575.3	26,049.8	20,850.3
Max.	24,456	! 27,780	1,676	! 1,808	593.0	! 688.7	26,622.2	! 29,132.3
Min.	23,147	* 10,727	1,395	! ! 1,186	538.2	! ! 76.9	25,366.2	! ! 13,062.6

! Maximum end of month storage for period of record
 ! ! Minimum end of month storage for period of record

* Minimum end of month storage since 1940

SUSPENDED SILT - 1986

The following tables are based on determinations of gravimetric percentages of dry silt in water samples taken at each station by one of the following methods.

A. By lowering a D-43 depth integrating sampler at verticals located at centers of sections of equal discharge in the river cross section, being careful to approach but not strike the bottom. The samples obtained in the section are combined to comprise a composite sample for that date.

B. By lowering a D-43 depth integrating sampler at verticals located at centers of each span of the service bridge across the Alamo Canal, being careful to approach but not strike the bottom. The samples obtained in the section are combined to comprise a composite sample for that date.

C. By sampling at the stream surface with a separate bottle at each of three points, spaced 1/6, 1/2, and 5/6 of the stream width. The gravimetric percentage in each sample is determined, a coefficient of 1.10 is applied to the average of the three, and the product applied to the volume of the stream flow represented by that set of samples.

For ease of comparison, the assumption is made that 1,847 tons of deposited silt would occupy a volume of one acre-foot, or one cubic foot of deposited silt would weigh 85 pounds.

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY

Month	Tons		Number of Samples	Gravimetric Percentages			Acre-Feet at 1,847 Tons/Ac.Ft.	1956-1986 Period of Record		
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum
Jan.	1,417,044,200	489,800	5	0.0345	0.0554	0.0135	265	66.5	712	1.4
Feb.	1,047,324,200	379,100	4	.0361	.0469	.0258	205	55.0	719	1.6
Mar.	1,241,294,300	340,100	4	.0274	.0357	.0216	184	74.5	611	6.3
Apr.	1,021,878,300	276,400	5	.0270	.0343	.0152	150	53.5	434	7.3
May	1,517,857,600	511,400	4	.0336	.0425	.0157	277	42.4	451	2.2
June	1,487,397,000	578,300	4	.0388	.0508	.0314	313	60.4	699	2.5
July	1,292,780,000	487,800	5	.0377	.0478	.0301	264	73.6	722	2.5
Aug.	1,186,844,600	357,900	4	.0301	.0444	.0185	194	62.4	617	3.8
Sept.	1,092,501,500	171,300	4	.0157	.0181	.0128	92.7	40.4	518	1.6
Oct.	1,056,920,100	226,300	5	.0214	.0326	.0097	123	32.1	452	.5
Nov.	941,092,600	330,400	4	.0351	.0740	.0106	179	44.6	689	.5
Dec.	1,221,886,400	417,400	5	.0385	.0529	.0186	255	59.6	715	.6
Yearly	14,524,820,800	4,620,200	53	0.0318	0.0740	0.0097	2,501.7	665.0	6,390	37.1

Samples by U. S. Section and analyses by United States Bureau of Reclamation, Method A

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE

Month	Tons		Number of Samples	Gravimetric Percentages			Acre-Feet at 1,847 Tons/Ac.Ft.	1952-1986 Period of Record		
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum
Jan.	303,471	64,886	4	0.0214	0.0685	0.0050	63.3	8.8	50.8	0.2
Feb.	277,319	44,134	4	.0159	.0236	.0089	23.8	9.8	59.8	.9
Mar.	479,913	93,934	4	.0196	.0291	.0134	50.8	42.2	154	5.3
Apr.	446,103	83,963	5	.0188	.0237	.0139	45.3	41.8	236.6	7.5
May	315,452	71,261	4	.0226	.0529	.0088	38.5	12.4	61.8	1.5
June	329,910	64,582	4	.0196	.0507	.0189	34.9	27.8	108.6	2.3
July	336,577	121,621	5	.0361	.0634	.0216	65.7	38.5	155.9	3.9
Aug.	350,672	99,611	4	.0284	.0728	.0137	53.8	36.8	135.3	3.8
Sept.	242,480	28,416	4	.0117	.0254	.0047	15.3	16.1	64.7	1.9
Oct.	181,441	20,170	5	.0111	.0190	.0045	10.9	5.4	48.2	.3
Nov.	176,079	27,742	4	.0158	.0226	.0063	15.0	5.0	54.9	.2
Dec.	198,403	33,070	5	.0167	.0300	.0035	17.8	7.4	23.7	1.1
Yearly	3,637,820	753,392	52	0.0198	0.0728	0.0035	40.8	252	809.0	51.4

Samples and analyses by Mexican Section, Method B

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY

Month	Tons		Number of Samples	Gravimetric Percentages			Acre-Feet at 1,847 Tons/Ac.Ft.	1946-1986 Period of Record		
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum
Jan.	1,146,951,200	1,100,900	1	0.0958	0.1080	0.0806	596			
Feb.	821,977,600	531,600	1	.0646	.0795	.0508	288			
Mar.	764,211,900	334,600	1	.0437	.0503	.0383	181			
Apr.	610,620,400	210,300	1	.0344	.0380	.0295	114			
May	1,211,401,700	566,100	1	.0467	.0638	.0276	306			
June	1,189,809,900	744,700	1	.0625	.0681	.0549	403			
July	993,952,200	540,100	1	.0542	.0544	.0541	292			
Aug.	833,083,300	461,200	1	.0553	.0599	.0539	250			
Sept.	873,489,100	595,800	0	.0681	.0750	.0604	323			
Oct.	900,741,100	674,200	1	.0747	.0785	.0691	369			
Nov.	831,061,100	527,400	1	.0634	.0687	.0593	286			
Dec.	1,052,606,700	698,500	1	.0662	.0683	.0632	378			
Yearly	11,229,906,200	6,985,400	11	0.0621	0.1080	0.0276	3,782			

Samples by U. S. Section and analyses by United States Bureau of Reclamation, Method A

CHEMICAL ANALYSES OF WATER SAMPLES

The tables below are based on chemical analyses of samples from the Colorado River at the Northerly International Boundary taken by the United States Section of the Commission and analyzed by the U. S. Bureau of Reclamation.

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY

1986	Time	Streamflow Momentary	Specific Conductance	pH	Hardness, Total (as CaCO ₃)	Hardness Noncarbonate (as CaCO ₃)	Calcium ion (Ca), Dissolved	Magnesium ion (Mg) Dissolved
Date	Std.	Sec.-Ft.	Micromhos	Units	mg/L	mg/L	mg/L	mg/L
Jan. 6	0830	18,000	933	7.9	312	182	82	26
Jan. 21	0830	15,900	945	8.1	307	165	79	27
Feb. 3	0830	18,700	978	7.7	300	162	77	26
Feb. 18	0830	15,900	939	8.0	312	180	79	28
Mar. 3	0830	13,300	1,010	8.0	287	173	76	24
Mar. 17	0830	17,500	962	7.9	295	163	78	24
Apr. 7	0830	15,400	961	8.2	300	164	78	26
Apr. 21	0830	11,100	1,000	8.1	310	160	80	27
May 5	0830	11,300	1,040	8.3	310	170	78	28
May 19	0830	23,200	961	8.0	317	183	75	32
June 2	0830	23,500	919	8.0	339	199	84	32
June 16	0830	16,700	920	8.2	300	156	77	26
July 7	0830	16,500	961	8.2	302	158	79	26
Aug. 4	0830	15,900	940	8.2	302	154	79	26
Aug. 18	0830	14,500	937	8.2	285	133	74	24
Sep. 2	0830	14,500	948	8.1	292	142	76	25
Sep. 15	0830	13,100	940	8.3	295	159	75	26
Oct. 6	0830	14,200	942	8.2	290	142	74	26
Oct. 20	0830	12,700	995	7.7	302	154	77	27
Nov. 3	0830	11,100	1,010	8.0	310	160	78	28
Nov. 17	0830	11,000	997	8.1	302	154	77	27
Dec. 1	0830	13,300	972	8.1	300	146	77	26
Dec. 15	0830	14,400	970	8.0	295	157	76	26

1986	Sodium ion (Na) Dissolved	Potassium ion (K) Dissolved	Sulfate ion (SO ₄) Dissolved	Chloride ion (Cl) Dissolved	Carbonate (as CO ₃)	Bicarbonate (as HCO ₃)	Nitrate (as NO ₃)	Solids Dissolved (Calculated)
Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Jan. 6	78	4	230	66	0	159	1.6	578
Jan. 21	77	4	214	73	0	173	1.6	571
Feb. 3	83	5	230	80	0	168	1.5	596
Feb. 18	82	5	230	74	0	161	1.4	589
Mar. 3	90	6	238	80	0	139	1.6	593
Mar. 17	77	4	233	71	0	161	1.5	569
Apr. 7	81	4	235	76	0	166	1.3	593
Apr. 21	91	4	228	83	0	183	1.5	617
May 5	90	5	264	75	10	171	1.3	645
May 19	78	4	238	74	0	163	1.2	593
June 2	74	5	228	76	0	171	1.1	592
June 16	76	4	211	68	0	176	1.2	562
July 7	90	4	240	78	0	176	1.2	613
Aug. 4	81	4	223	72	0	181	1.3	585
Aug. 18	85	4	214	74	0	185	1.3	575
Sep. 2	86	4	233	68	0	183	1.2	593
Sep. 15	86	4	230	70	5	166	1.2	591
Oct. 6	81	5	223	77	0	181	1.4	586
Oct. 20	85	4	240	78	0	181	1.1	614
Nov. 3	87	4	238	85	0	183	1.4	624
Nov. 17	86	4	233	89	0	181	1.6	618
Dec. 1	85	4	226	75	0	188	1.6	597
Dec. 15	85	4	233	69	0	168	1.6	588

SPECIFIC CONDUCTANCE OF WATER SAMPLES

The following tables show specific conductance of individual water samples taken at Colorado River stations and in Mexican canals. Samples were taken at the northerly international boundary by both Sections of the Commission and at the southerly international boundary by the United States Section. Determinations for the northerly international boundary were made by the Bureau of Reclamation; and for the southerly international boundary, by the United States Section of the Commission. Samples for the Intake Canal at Morelos Dam were taken by the Mexican Section of the Commission, and determinations were made by the Ministry of Agriculture and Hydraulic Resources of Mexico. No samples were taken at the Miguel C. Rodriguez gaging station.

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY
SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1986

DAY	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	965	943	1,040	961	1,060	920	944	966	950	960	1,020	972
2	985	940	1,020	969	1,060	919	954	961	948	965	1,010	986
3	969	978	1,010	990	1,060	925	947	950	969	963	1,010	988
4	963	1,020	1,030	971	1,050	925	951	940	959	956	1,050	985
5	956	1,080	1,020	966	1,040	934	956	969	964	949	1,010	985
6	933	1,100	1,010	965	1,020	926	952	966	963	942	993	983
7	963	1,210	978	961	1,060	930	961	959	962	961	1,000	977
8	964	1,160	970	969	1,030	940	960	960	961	971	1,000	972
9	962	1,010	968	970	982	976	955	955	969	1,040	1,000	978
10	956	952	982	986	985	967	971	952	974	983	1,000	974
11	954	959	967	983	987	948	978	954	967	982	996	975
12	951	973	973	989	989	964	975	951	962	987	993	987
13	949	972	956	985	991	954	970	952	960	992	983	981
14	957	968	939	997	992	943	967	953	950	997	979	975
15	965	961	935	992	967	932	972	963	940	991	985	970
16	963	954	933	992	958	920	959	952	966	995	991	973
17	996	946	962	998	958	946	972	943	964	995	997	977
18	999	939	965	1,010	951	941	963	937	966	995	978	969
19	985	965	976	1,010	961	946	972	948	961	995	962	967
20	971	998	967	1,000	958	949	981	958	963	985	980	956
21	945	1,020	965	1,000	951	945	991	957	966	1,030	977	945
22	964	1,030	962	1,030	959	941	968	958	969	1,010	982	940
23	965	1,040	959	1,020	939	962	921	966	960	1,010	987	936
24	961	1,050	988	1,030	936	942	924	974	963	1,020	994	939
25	956	1,040	970	1,060	933	988	951	982	949	1,020	975	938
26	950	1,030	969	1,060	930	954	951	958	956	1,020	985	937
27	963	1,050	981	1,050	928	949	948	964	956	1,020	986	936
28	956	1,050	987	1,050	928	948	951	971	955	1,010	988	936
29	960		982	1,030	927	949	952	957	954	1,010	983	935
30	965		972	1,060	928	950	955	955	959	1,020	977	936
31	946		976		927		969	952		1,020		938

* Estimated

SPECIFIC CONDUCTANCE OF WATER SAMPLES

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1986

DAY	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	■ 968	986	988	966	1,010	934	947	960	943	944	994	965
2	969	946	980	969	1,000	942	956	961	972	951	984	959
3	949	980	995	949	998	935	924	953	952	949	997	964
4	958	1,010	1,020	945	1,010	942	941	■ 959	944	946	1,000	890
5	934	1,020	1,010	948	1,020	922	927	■ 966	954	943	974	900
6	953	1,040	985	956	1,000	925	947	972	962	949	968	860
7	955	1,140	933	958	1,020	929	946	926	953	939	964	880
8	992	1,080	929	961	974	934	944	946	946	947	970	860
9	948	984	967	966	933	937	959	947	962	996	973	890
10	953	950	974	964	949	936	944	■ 951	952	963	961	880
11	944	954	972	961	907	939	951	955	942	965	971	870
12	948	954	960	1,000	972	946	958	945	950	934	974	920
13	955	964	969	976	987	945	928	942	970	934	966	890
14	983	953	915	994	978	946	955	948	950	966	963	880
15	969	956	■ 934	997	940	941	964	948	924	964	965	890
16	958	953	953	984	941	940	963	946	950	971	976	890
17	990	947	965	921	952	940	935	934	954	975	975	920
18	995	961	958	996	953	967	900	955	958	958	962	880
19	950	962	911	953	957	938	949	953	954	981	956	870
20	949	970	921	926	954	934	943	949	953	978	959	850
21	958	993	920	973	947	936	962	954	949	979	962	840
22	956	940	920	1,010	955	933	955	956	946	978	963	850
23	985	996	958	999	929	952	934	976	942	966	975	860
24	962	998	972	1,000	956	941	888	951	939	976	969	860
25	960	1,000	946	1,010	945	953	935	963	935	975	965	890
26	956	998	974	999	928	935	933	943	935	979	962	860
27	961	984	925	997	944	940	934	■ 936	944	989	958	860
28	956	984	917	1,010	944	937	952	930	936	978	965	860
29	961		908	999	938	936	940	948	943	980	954	870
30	958		920	1,040	940	945	957	947	939	964	961	880
31	941		987		939		959	937		987		850

■ Estimated

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1986

January	March	May	July	August	October	December
7 953	18 970	20 962	14 970	1 952	28 1,010	1 978
28 955			29 950	26 989		22 946
February	April	June		September	November	
11 957	1 964	24 948		2 979	3 1,030	
	15 1,030			15 964		

RAINFALL ON THE COLORADO RIVER WATERSHED IN INCHES

Tabulated below are monthly records of rainfall at stations located in California and Arizona in the United States and in Baja California and Sonora in Mexico, with averages for their periods of record. Records of daily rainfall amounts, where available, are on file in the offices of the United States or Mexican Sections of the Commission. For location, elevation, period of record, and the observer, see alphabetical listings of these stations on following page in this bulletin.

IN THE UNITED STATES

Month	Brawley, California		El Centro, California		Blythe, California		Yuma Citrus Station, Arizona		Bullhead City, Arizona	
	1986	Average 1931-1986	1986	Average 1931-1986	1986	Average 1931-1986	1986	Average 1931-1986	1986	Average 1978-1986
Jan.	0.24	0.35	0.14	0.37	0.22	0.43	0.08	0.40	0.47	1.11
Feb.	.64	.34	.54	.36	.60	.42	.33	.35	.53	.84
Mar.	.11	.24	.11	.22	.18	.41	.16	.26	.61	1.23
Apr.	.01	.09	.01	.09	.02	.13	0	.11	.03	.14
May	0	.02	0	.01	0	.03	0	.02	T	.15
June	0	.01	0	.01	0	.04	.11	.02	0	.01
July	.06	.07	.26	.10	.19	.19	.27	.20	.05	.57
Aug.	T	.38	.16	.36	.04	.80	.06	.57	1.08	1.14
Sep.	.01	.34	.07	.30	1.21	.40	.40	.36	.52	.58
Oct.	2.20	.26	2.41	.27	.92	.30	.07	.39	.41	.36
Nov.	.28	.18	.17	.19	.22	.27	.13	.19	.62	.70
Dec.	.10	.44	.04	.46	.25	.54	.22	.43	1.19	1.02
Yearly	3.65	2.72	3.91	2.74	3.85	3.96	1.83	3.30	5.51	7.85

IN MEXICO

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		San Luis, R. C., Sonora		Delta, Baja California	
	1986	Average 1948-1986	1986	Average 1926-1986	1986	Average 1948-1986	1986	Average 1949-1986	1986	Average 1948-1986
Jan.	T	0.39	0.08	0.35	0.31	0.35	0.04	0.31	0.12	0.36
Feb.	.16	.24	.35	.31	.28	.20	.28	.28	.35	.28
Mar.	.24	.16	.04	.24	.12	.16	.08	.24	.08	.16
Apr.	0	.08	0	.08	0	.12	0	.04	0	.08
May	0	T	0	T	0	T	0	.04	0	T
June	.04	T	0	T	0	.04	.08	.04	.04	T
July	.63	.12	.20	.16	.08	.08	0	.24	0	.08
Aug.	0	.39	.35	.39	.08	.28	.12	.47	0	.28
Sept.	.39	.20	.08	.39	.47	.16	.31	.28	0	.24
Oct.	0	.28	1.89	.31	0	.28	0	.35	0	.31
Nov.	.12	.16	.24	.16	.08	.16	.08	.43	.16	.12
Dec.	.31	.39	.12	.75	.24	.28	.16	.63	0	.35
Yearly	1.90	2.44	3.35	3.19	1.65	1.97	1.14	2.91	.75	2.20

Month	Colonia Juarez, Baja California		Laguna Salada, Baja California		Riito, Sonora		San Felipe, Baja California		El Centinela, Baja California	
	1986	Average 1952-1986	1986	Average 1975-1986	1986	Average 1959-1986	1986	Average 1969-1986	1986	Average 1978-1986
Jan.	0.08	0.47	0	0.31	0.12	0.28	0	0.31	0.39	0.31
Feb.	.31	.31	.20	.35	.35	.28	.12	.16	.20	.31
Mar.	.04	.27	#	.08	.04	.16	0	.12	1.18	.28
Apr.	0	.08	0	.08	0	.04	0	.04	0	0
May	0	.04	0	.04	0	T	0	.04	0	0
June	0	T	#	0	0	.04	0	.04	0	0
July	.16	.20	#	.20	.67	.12	0	.16	0	0
Aug.	0	.35	0	.67	.16	.28	0	.47	.04	.43
Sept.	.16	.28	0	.67	.08	.47	0	.35	0	.04
Oct.	0	.43	1.57	.28	0	.39	0	.24	1.60	.31
Nov.	.12	.24	.08	.12	.08	.24	.79	.24	0	.08
Dec.	.51	.39	.12	.87	.04	.39	0	.43	T	.55
Yearly	1.38	2.44			1.54	2.76	.90	2.72	3.39	2.83

* Blythe FAA Airport

T Trace

Missing record

LOCATION OF RAINFALL STATIONS ON THE COLORADO RIVER WATERSHED

The precipitation records of the stations listed alphabetically below began on the date shown and extend through 1986.

IN THE UNITED STATES

NAME OF STATION	LATI- TUDE	LONGI- TUDE	5 ELEV. (FT.)	RECORD BEGAN	OBSERVER
* Blythe, California	33° 37'	114° 36'	268	1909	State Division of Forestry
Brawley, California	32° 57'	115° 33'	100	1908	Agricultural Research Service
Bullhead City, Arizona	35° 07'	114° 36'	580	1980	Bullhead City Fire Department
El Centro, California	32° 46'	115° 34'	30	1930	El Centro Water Department
Yuma Citrus Station, Arizona	32° 37'	114° 39'	191	1923	University of Arizona Experimental Farm

IN MEXICO

NAME OF STATION	LATI- TUDE	LONGI- TUDE	5 ELEV. (FT.)	RECORD BEGAN	OBSERVER
Bataques, Baja California	32° 34'	115° 00'	** 66	1948	# S. A. R. H.
Colonia Juarez, Baja California	32° 18'	115° 05'	49	1952	S. A. R. H.
Delta, Baja California	32° 21'	115° 11'	** 39	1948	S. A. R. H.
El Centinela, Baja California	32° 35'	115° 45'	164	1978	S. A. R. H.
Laguna Salada, Baja California	32° 12'	115° 44'	7	1975	S. A. R. H.
Los Algodones, Baja California	32° 42'	114° 44'	115	1948	S. A. R. H.
Mexicali, Baja California	32° 40'	115° 28'	13	1926	S. A. R. H.
Riito, Sonora	32° 13'	115° 01'	43	1959	S. A. R. H.
San Felipe, Baja California	31° 01'	114° 51'	72	1969	S. A. R. H.
San Luis, R. C., Sonora	32° 28'	114° 51'	131	1949	S. A. R. H.
Santa Clara, Sonora	31° 42'	114° 29'	49	1971	S. A. R. H.

* Not shown on map

5 Elevation above mean sea level except Brawley and El Centro, which are elevations below mean sea level

** Elevations obtained from International Boundary and Water Commission topographic maps

Ministry of Agriculture and Hydraulic Resources

EVAPORATION IN THE COLORADO RIVER BASIN IN INCHES

Tabulated below are records of evaporation observed at one station in Arizona and at nine stations in Baja California and Sonora, Mexico. The station in the United States is operated by the University of Arizona Experimental Farm. The stations in Mexico are operated by the Ministry of Agriculture and Hydraulic Resources. The type of pan used at all these stations was the National Weather Service standard pan of 4-foot diameter. For specific location of these stations, refer to data opposite the same station name shown in "Location of Rainfall Stations," page 42 in this bulletin.

IN THE UNITED STATES

Month	Yuma Citrus Station, Arizona	
	1986	Average 1931-1986
Jan.	4.09	3.87
Feb.	4.10	4.76
Mar.	6.78	7.40
Apr.	9.20	10.04
May	# 12.05	12.98
June	12.88	14.25
July	12.41	15.26
Aug.	11.85	13.44
Sept.	8.50	10.61
Oct.	6.32	7.50
Nov.	4.57	4.91
Dec.	3.47	3.64
Yearly	96.22	108.66

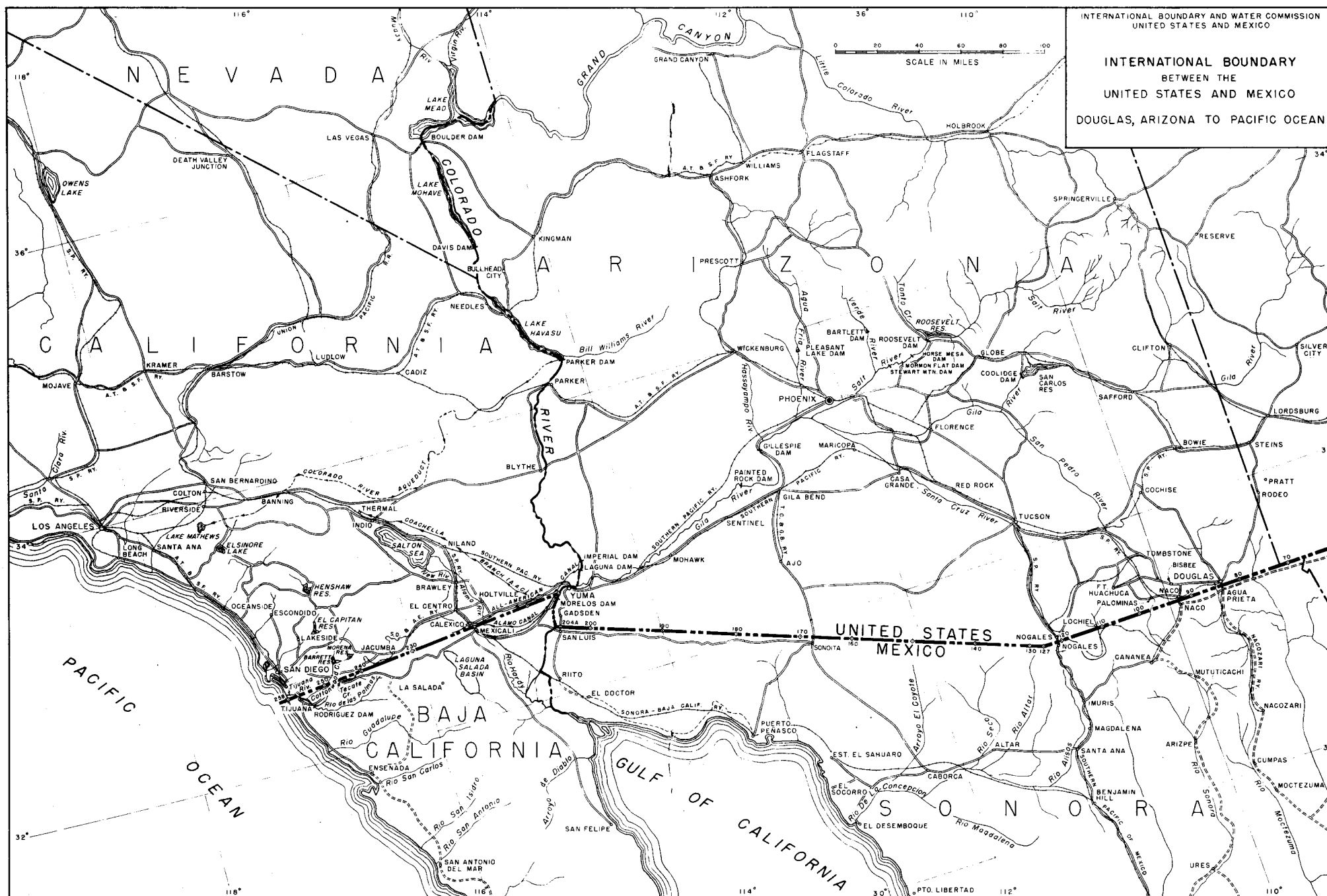
IN MEXICO

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		San Luis R. C. Sonora		Delta, Baja California	
	1986	Average 1948-1986	1986	Average 1926-1986	1986	Average 1948-1986	1986	Average 1953-1986	1986	Average 1948-1986
Jan.	4.57	4.45	2.09	2.56	3.78	3.78	#	3.27	#	3.39
Feb.	4.65	5.24	3.07	5.39	4.45	4.65	5.51	4.09	4.06	4.33
Mar.	6.18	7.52	4.61	5.83	6.38	6.89	5.43	6.18	5.91	6.14
Apr.	9.33	10.28	6.38	7.91	9.25	8.74	7.64	8.23	9.88	8.19
May	12.13	12.91	10.04	10.55	11.06	11.54	9.96	10.94	9.06	10.35
June	12.91	13.94	11.54	11.73	11.97	12.99	9.13	12.52	12.17	10.98
July	10.91	13.82	10.47	11.73	11.93	12.87	10.35	13.58	13.23	11.65
Aug.	10.20	12.44	#	10.08	11.69	11.14	10.59	12.24	11.54	10.59
Sept.	9.69	10.24	#	8.07	7.48	9.21	7.09	9.41	7.95	8.54
Oct.	8.90	8.11	#	5.71	6.57	6.50	6.14	6.38	6.61	6.10
Nov.	4.96	5.28	2.48	3.35	4.84	4.84	4.65	4.25	4.41	4.25
Dec.	3.35	4.25	04	2.36	2.87	3.43	2.36	3.15	8.74	3.35
Yearly	97.76	109.65		83.54	92.28	96.65		95.71		79.09

Month	Colonia Juarez, Baja California		Laguna Salada, Baja California	
	1986	Average 1970-1986	1986	Average 1975-1986
Jan.	4.09	3.70	7.36	4.61
Feb.	4.29	4.45	#	4.76
Mar.	7.56	6.54	#	7.01
Apr.	9.76	8.31	#	8.34
May	12.52	10.87	#	11.06
June	14.65	12.64	#	13.19
July	14.21	12.76	#	13.62
Aug.	#	11.14	#	11.81
Sept.	9.61	9.61	9.96	8.62
Oct.	6.97	7.40	8.23	7.83
Nov.	#	4.84	5.91	5.39
Dec.	#	3.54	#	3.86
Yearly		97.24		103.27

* Estimated

Missing record



TEMPERATURE IN THE COLORADO RIVER BASIN
IN DEGREES FAHRENHEIT

The maximum, minimum, and monthly mean temperature observations for United States stations are from daily readings of thermometers generally exposed in a shelter located a few feet above sod-covered ground. The maximum and minimum temperatures shown for the stations in Mexico are from daily maximum and minimum thermometer observations, with maximum and minimum for their periods of record. For specific location, elevation, period of record, and the observer, refer to data opposite same station name as shown in "Location of Rainfall Stations," page 42 in this bulletin.

IN THE UNITED STATES

Month	Blythe, California				Yuma Citrus Station, Arizona				Brawley, California			
	1986			Average 1931-86	1986			Average 1931-86	1986			Average 1931-86
	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	57.1	78	36	52.8	59.4	80	38	53.3	59.7	84	35	54.0
Feb.	60.3	93	28	57.4	58.8	93	29	57.0	61.6	97	30	58.2
Mar.	67.3	94	43	63.0	66.3	96	42	62.1	67.4	98	39	63.2
Apr.	72.2	100	50	70.1	69.3	97	44	68.6	70.8	99	46	69.7
May	80.0	110	52	77.6	76.7	104	47	75.8	76.9	106	46	77.2
June	90.0	115	65	85.5	86.1	112	61	83.7	86.6	116	60	85.1
July	89.8	114	67	92.4	87.9	111	65	91.0	88.6	114	64	91.8
Aug.	93.4	115	74	90.9	92.1	113	76	90.2	92.4	116	67	91.3
Sept.	79.2	112	52	84.8	78.7	110	51	84.8	80.0	113	50	86.0
Oct.	70.4	95	47	73.0	70.1	93	46	73.3	72.0	96	49	74.8
Nov.	61.6	82	39	60.1	62.1	83	40	61.3	63.6	87	39	62.4
Dec.	52.8	72	29	53.2	54.3	73	32	54.5	55.3	77	29	55.1
Yearly	72.8	115	28	71.7	71.8	113	29	71.3	72.9	116	29	72.4

Month	El Centro, California				Bullhead City, Arizona							
	1986			Average 1931-86	1986			Average 1978-86				
	Mean	Max.	Min.		Mean	Max.	Min.					
Jan.	61.5	82	37	54.0	58.9	77	36	53.9				
Feb.	62.5	93	36	58.1	61.2	93	32	58.0				
Mar.	68.4	93	41	63.0	68.6	97	42	63.2				
Apr.	70.6	96	49	69.5	73.4	100	52	71.0				
May	78.6	105	52	77.2	82.3	111	55	80.5				
June	87.7	113	63	85.1	93.5	120	72	90.2				
July	90.1	114	69	91.7	93.5	114	70	94.8				
Aug.	92.9	111	67	91.0	96.3	119	73	93.5				
Sept.	80.9	111	53	85.5	81.5	113	54	86.2				
Oct.	72.8	94	53	74.5	72.3	95	46	73.5				
Nov.	64.6	86	42	62.2	64.7	90	41	61.1				
Dec.	56.8	79	34	54.8	53.5	72	32	53.3				
Yearly	74.0	114	34	72.2	75.0	120	32	73.3				

IN MEXICO

Month	Los Algodones, Baja California				Mexicali, Baja California				Bataques, Baja California			
	1986		1948-1986		1986		1926-1986		1986		1948-1986	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	77	37	88	23	75	37	93	19	81	39	113	16
Feb.	93	32	95	28	88	32	93	23	95	37	99	21
Mar.	93	41	100	32	91	43	100	30	97	43	113	25
Apr.	99	39	109	37	99	48	106	34	95	46	118	16
May	104	50	117	43	106	50	117	43	109	48	124	34
June	111	63	126	52	115	66	120	48	115	61	135	43
July	113	64	118	61	115	70	118	55	113	64	133	45
Aug.	115	68	120	61	113	77	120	54	113	72	129	46
Sept.	111	52	122	50	109	55	122	48	115	50	135	39
Oct.	95	48	111	32	90	54	111	32	97	46	118	32
Nov.	91	43	100	27	86	45	104	28	86	39	115	32
Dec.	72	34	90	23	70	37	90	23	77	30	97	25
Yearly	115	32	126	23	115	32	122	19	115	30	135	16

■ Blythe FAA Airport

TEMPERATURE IN THE COLORADO RIVER BASIN
IN DEGREES FAHRENHEIT

IN MEXICO

Month	Riito, Sonora				San Felipe, Baja California				San Luis, R. C., Sonora			
	1986		1949-1986		1986		1969-1986		1986		1949-1986	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	77	39	91	19	79	41	99	30	81	41	100	19
Feb.	91	32	95	21	91	37	102	32	95	32	109	27
Mar.	97	41	100	25	97	50	104	32	99	46	108	28
Apr.	97	45	109	36	95	48	113	34	100	48	115	37
May	106	48	115	41	113	50	120	41	108	50	115	41
June	113	61	124	45	113	59	124	50	115	61	126	45
July	113	59	140	52	108	68	124	50	117	66	126	59
Aug.	113	75	122	46	113	68	135	41	113	72	126	55
Sept.	109	50	118	39	102	54	126	37	115	50	118	50
Oct.	93	48	115	30	99	50	117	23	97	48	118	32
Nov.	86	41	118	27	86	48	118	21	88	41	113	28
Dec.	79	32	86	21	79	39	97	28	77	32	102	23
Yearly	113	32	142	19	113	37	135	21	117	32	126	19

Month	Delta, Baja California				Colonia Juarez, Baja California				Laguna Salada, Baja California			
	1986		1948-1986		1986		1964-1986		1986		1975-1986	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	82	37	104	27	84	37	91	19	82	39	84	18
Feb.	97	32	104	28	102	32	102	21	93	36	95	27
Mar.	97	37	113	28	97	41	97	25	#	#	95	32
Apr.	100	37	118	32	99	43	115	30	99	41	100	36
May	109	41	129	32	111	46	117	36	97	39	115	39
June	115	46	133	36	113	55	122	39	#	#	120	50
July	122	68	135	45	113	64	122	45	#	#	122	54
Aug.	118	72	140	52	#	#	118	50	117	73	118	52
Sept.	122	50	135	39	111	46	122	39	115	48	118	48
Oct.	97	43	117	34	95	46	108	36	95	57	118	36
Nov.	91	37	120	32	86	37	104	25	86	48	95	28
Dec.	79	34	104	27	77	28	97	19	73	39	86	19
Yearly	122	32	140	27	113	32	122	19			122	18

Month	El Centinela, Baja California											
	1986		1977-1986									
	Max.	Min.	Max.	Min.								
Jan.	82	46	82	34								
Feb.	90	39	90	25								
Mar.	91	52	91	41								
Apr.	97	54	106	46								
May	97	52	113	52								
June	113	73	118	50								
July	115	68	120	68								
Aug.	111	75	115	64								
Sept.	111	59	115	52								
Oct.	100	57	108	50								
Nov.	86	48	93	39								
Dec.	77	39	82	30								
Yearly	115	39	120	25								

Missing record

IRRIGATED AREAS ALONG COLORADO RIVER BELOW IMPERIAL DAM

1986

The total drainage area within the Colorado River basin is about 246,000 square miles, of which 184,600 square miles lie above Imperial Dam and about 61,400 square miles are below the dam. Of the area below Imperial Dam, 59,400 square miles are in the United States and about 2,000 square miles are in Mexico. The area below Imperial Dam includes the Gila River watershed with a total area of about 58,200 square miles, of which about 1,100 square miles are in Mexico.

The irrigated areas tabulated below comprise the areas in the United States and Mexico which are served by diversions from the Colorado River at or below Imperial Dam. The diversions are supplemented by some pumping from wells in both countries. The areas in the United States include: 1) those within the U. S. Bureau of Reclamation Projects and in the North and South Gila Valleys located near Yuma, Arizona, the data for which are furnished by the U. S. Bureau of Reclamation; 2) those within the Coachella Valley, California, the data for which are furnished by the Coachella Valley County Water District; and 3) those within the Imperial Valley; California, the data for which are furnished by the Imperial Irrigation District. The areas in Mexico include those in the Mexicali Valley located in the states of Baja California and Sonora, the data for which are furnished by the Ministry of Agriculture and Hydraulic Resources of Mexico. The areas tabulated below refer to the total areas farmed, and insofar as possible, duplication of irrigated areas because of double cropping has been eliminated.

Point of Diversion from Colorado River and Designation of Areas	Total Irrigated Areas Acres
IN UNITED STATES:	
Imperial Dam	
Yuma Valley Division	46,195
Reservation Division	11,416
Yuma Mesa	16,909
Yuma Aux. Project Unit "B" (Yuma Mesa)	2,511
South Gila Valley	9,655
North Gila Valley	5,793
Wellton-Mohawk	59,170
Coachella Valley	56,580
Imperial Valley	458,993
Warren Act	80
Non-Project lands adjacent to Colorado River	12,560
Total in United States	679,862
IN MEXICO:	
Morelos Dam	
Mexicali Valley	* 518,614
Total in United States and Mexico	1,198,476

* An estimated 33% of total acreage is served by pumping from ground water in Mexicali Valley

ALAMO RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Staff gage located on the right bank of the river, about 7 miles (11.3 km) east of Calexico, California, immediately downstream from the international land boundary between the United States and Mexico and a few feet upstream from a 4-foot (1.22 m) Cipolletti weir in the throat of a twin-tube concrete culvert which carries the river flow under the All-American Canal.

RECORDS: Computed on the basis of head on the Cipolletti weir from daily staff gage readings, and weir ratings as determined by monthly current meter measurements. Records obtained and furnished by Imperial Irrigation District. Records available: June 1942 through 1986.

REMARKS: The flow at this station normally comprises seepage from the All-American Canal and drainage water from the Mexicali Valley which enters the United States.

EXTREMES: Maximum mean daily discharge, 258 second-feet (7.31 m³/sec) (estimated), April 13, 1946; minimum discharge, no flow July 22-23, 29-30, 1949. Prior to the period of record, and since 1900, considerably higher flows occurred. During the years 1905 to 1907, when the Colorado River flowed into the Salton Sea, a part of its flow passed through the Alamo River channel.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.34	2.44	2.75	2.96	3.65	3.79	3.38	2.75	1.92	1.92	2.13	2.23
2	2.34	2.54	2.75	4.07	3.65	4.07	3.38	3.24	1.92	1.92	2.13	2.23
3	3.24	2.44	4.07	4.07	2.96	3.93	3.10	3.52	1.92	1.64	2.13	2.34
4	3.24	2.54	4.62	4.35	4.07	3.65	2.96	2.13	1.92	1.92	2.13	2.13
5	2.44	2.44	3.24	3.38	3.93	2.23	2.54	2.34	1.92	1.64	2.02	2.13
6	1.92	2.34	4.07	3.52	3.65	2.34	2.75	2.67	1.92	1.64	2.13	1.92
7	1.92	2.23	2.44	3.52	3.65	2.13	2.13	2.13	1.92	1.83	1.92	1.92
8	1.92	2.54	2.65	2.75	3.38	2.34	2.13	2.02	2.02	1.92	1.74	2.13
9	2.96	2.75	3.65	2.54	3.38	2.34	2.02	3.52	2.02	1.74	1.92	2.13
10	3.24	2.65	3.24	2.44	3.65	2.75	2.34	2.13	2.96	2.23	2.44	2.54
11	2.96	2.65	2.96	2.75	3.52	2.23	2.23	2.23	1.92	2.13	1.92	2.44
12	3.79	2.65	2.96	2.23	3.52	3.10	2.02	2.96	1.74	1.92	3.24	2.23
13	2.96	2.44	2.65	2.96	3.65	2.65	2.23	2.54	1.55	1.92	4.62	2.34
14	2.65	2.44	2.75	3.24	3.24	2.75	2.96	4.07	1.55	1.92	2.65	2.44
15	2.44	2.23	2.54	3.24	4.07	2.96	2.96	2.34	1.74	2.34	2.96	3.10
16	2.23	2.54	2.65	3.52	3.79	2.44	3.65	2.44	1.74	2.96	2.54	3.65
17	2.13	2.44	2.54	3.24	4.90	2.44	3.93	2.23	1.46	2.13	2.23	3.38
18	2.23	3.24	2.54	3.24	4.07	2.13	4.62	2.23	1.64	2.13	2.02	2.54
19	2.23	2.75	2.54	2.96	4.07	2.13	3.24	2.54	1.74	1.74	2.13	2.34
20	2.13	3.24	2.96	3.24	4.21	2.02	2.34	2.23	1.64	1.64	2.96	2.13
21	3.24	3.24	2.65	2.96	4.07	2.13	2.54	2.96	1.83	1.64	2.75	1.92
22	2.44	3.38	2.96	2.96	3.93	2.34	2.96	1.92	1.83	1.74	2.34	2.23
23	3.24	3.24	2.96	2.96	4.07	2.34	2.44	1.92	1.83	2.13	2.34	2.13
24	3.24	2.96	3.38	2.96	4.07	2.13	2.23	1.92	1.74	2.13	2.13	2.44
25	3.79	3.10	4.07	3.10	3.52	2.13	2.23	1.92	1.92	1.92	2.23	2.44
26	3.65	2.96	3.38	3.65	3.52	2.44	1.92	2.23	1.92	1.92	2.13	2.65
27	3.24	2.96	2.65	3.52	3.52	2.13	2.75	2.75	2.34	2.75	1.74	2.65
28	3.24	2.75	2.96	3.24	3.38	2.54	1.74	2.34	2.13	2.75	1.92	2.44
29	2.44		2.96	4.07	3.38	2.75	1.74	1.92	2.13	2.54	1.92	2.44
30	2.34		3.24	3.93	2.96	2.44	1.74	2.13	1.74	2.23	1.92	2.13
31	2.44		4.62		2.96		2.75	1.92		2.13		1.92
Sum	84.61	76.12	96.40	97.57	114.39	77.79	81.95	76.19	56.57	63.11	69.38	73.68
Current Year 1986										Period 1943-1986		
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	0.46	0.30	112	3.79	16	1.92	2.73	168	305	2,790	99	
Feb.	.43	.33	22	3.38	17	2.23	2.72	151	278	2,822	90.2	
Mar.	.52	.35	14	4.62	7	2.44	3.11	191	316	3,154	87.1	
Apr.	.50	.33	4	4.35	12	2.23	3.25	194	335	2,222	97	
May	.54	.40	17	4.90	3	2.96	3.69	227	265	1,799	73	
June	.48	.31	2	4.07	20	2.02	2.59	154	256	1,686	61	
July	.52	.28	18	4.62	128	1.74	2.64	163	237	1,712	59	
Aug.	.48	.30	14	4.07	122	1.92	2.46	151	280	1,672	65.7	
Sept.	.40	.25	10	2.96	17	1.46	1.89	112	263	1,406	83.5	
Oct.	.40	.27	16	2.96	13	1.64	2.04	125	277	1,845	61.6	
Nov.	.52	.28	13	4.62	18	1.74	2.31	138	287	2,080	62.4	
Dec.	.45	.30	16	3.65	16	1.92	2.38	146	271	1,686	80.0	
Yearly	0.54 0.25			4.90		1.46	2.65	1,920	3,370	22,146	1,071	
	Meters		Cubic Meters per Second						Thousands of Cubic Meters			
	0.16 0.08			0.14		0.04	0.08	2,368	4,157	27,317	1,321	

g Mean daily

! And other days

NEW RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder located on the left (west) bank of the river in the limits of the city of Calexico, California, 1,400 feet (427 m) downstream (north) from the international land boundary between the United States and Mexico. Measurements are made from a foot bridge at the gage.

RECORDS: Based on a continuous record of gage heights and current meter measurements by the Imperial Irrigation District. Records computed and furnished by the District. Records available: June 1942 through 1986.

REMARKS: The New River flows northward from Mexico into the United States and thence into the Salton Sea. The flow at this station normally comprises 1) a portion of the waste and drainage water from the irrigation system in the Mexicali Valley, and 2) sewage and other wastes from Mexicali, Baja California. Flood waters enter the river from local drainage in Mexico, and such waters can reach damaging rates during violent desert storms. Waste flows from the Mexican system of canals are limited to an average annual quantity of 35,000 acre-feet (43,172,000 m³) during any successive five-year period under the provisions of Minute No. 197 of the Commission.

EXTREMES: Maximum mean daily discharge, 1,030 second-feet (29.2 m³/sec) on December 9, 1982; minimum mean daily discharge, 2 second-feet (0.06 m³/sec) on May 14, 1945. Prior to the period of record, and since 1900, much higher flows occurred. During the years 1905 to 1907, when the Colorado River flowed into the Salton Sea, a considerable part of its flow passed through the New River channel.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Annual and Period Summary												
Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	421	405	323	533	418	321	339	296	431	307	283	329
2	494	437	327	521	388	323	362	291	428	296	279	338
3	479	459	347	498	378	349	400	298	406	278	298	385
4	429	451	371	486	383	356	391	309	396	271	338	374
5	392	451	378	482	428	319	359	344	361	270	349	360
6	354	420	364	452	465	297	343	328	325	276	344	370
7	339	371	337	467	452	293	339	303	324	298	324	405
8	322	416	321	480	457	289	349	290	325	318	322	430
9	317	423	336	502	424	298	339	289	337	476	334	428
10	318	437	437	493	382	319	340	304	347	525	329	387
11	319	379	511	498	371	309	363	325	335	406	315	355
12	332	355	546	491	389	298	359	386	318	370	305	312
13	332	343	526	486	393	279	364	420	300	339	292	312
14	363	338	463	494	369	284	344	432	321	315	307	331
15	362	357	437	524	337	294	352	442	343	326	318	362
16	349	405	445	494	314	297	365	430	346	354	341	366
17	347	444	476	483	316	322	381	425	326	361	349	340
18	337	430	485	481	326	324	374	408	336	359	334	314
19	340	395	479	468	320	316	369	408	330	348	350	306
20	355	360	455	459	321	296	365	398	323	345	351	311
21	365	341	430	431	324	269	370	377	324	349	329	340
22	345	330	409	449	300	282	432	354	339	329	347	362
23	337	345	397	435	293	295	439	343	357	311	330	395
24	293	346	384	388	291	335	424	341	374	314	308	415
25	317	327	388	368	314	371	380	369	398	302	296	428
26	331	333	395	362	332	361	363	392	379	309	281	454
27	353	362	381	389	355	324	365	403	337	305	287	459
28	388	337	377	428	341	292	354	417	324	320	296	395
29	393	370	447	330	302	344	429	307	337	337	295	333
30	369	400	435	319	324	345	428	298	315	313	323	337
31	382	463		323		309	439		312			
Sum	11,174	10,797	12,758	13,924	11,153	9,338	11,322	11,418	10,395	10,341	9,544	11,356
Current Year 1986								Period 1943-1986				
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	38.30	40.22	2	494	24	293	360	22,163	9,170	22,171	1,751	
Feb.	38.64	39.89	3	459	25	327	386	21,416	8,165	21,416	1,258	
Mar.	37.83	39.95	12	546	8	321	412	25,305	9,158	25,305	1,008	
Apr.	37.95	39.55	1	533	26	362	464	27,618	9,558	27,618	1,390	
May	38.58	40.24	6	465	24	291	360	22,122	8,628	24,111	629	
June	39.46	40.45	25	371	21	269	311	18,522	7,361	20,287	1,087	
July	38.83	40.06	23	439	31	309	365	22,457	7,857	22,998	817	
Aug.	38.80	40.26	15	442	9	289	368	22,647	8,959	27,618	1,139	
Sept.	38.90	40.17	1	431	30	298	347	20,618	8,639	23,714	1,795	
Oct.	38.02	40.44	10	525	5	270	334	20,511	8,653	22,758	2,081	
Nov.	39.66	40.35	20	351	2	279	318	18,930	8,141	20,741	2,483	
Dec.	38.64	40.09	27	459	19	306	366	22,524	9,236	22,784	1,763	
Yearly	37.83	40.45		546		269	366	264,833	103,525	267,896	24,573	
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters				
	11.53	12.33		15.5		7.62	10.4	326,666	127,696	330,444	30,310	

* Mean daily

** Feet below mean sea level

WASTES FROM MEXICALI POTABLE WATER PLANT TO NEW RIVER IN MEXICO

DESCRIPTION: An 11.5-foot (3.50 m) Parshall flume installed by the State Commission of Public Services of Mexicali. Located 1.2 miles (2.0 km) upstream of the pumping plant on the supply canal. Excess water discharges into an open channel, thence into a 36-inch (91 cm) diameter pipe that empties into Rivera Drain (Drain 134), which is 1.2 miles (2.0 km) below the plant and 1.2 miles (2.0 km) south of the international boundary. From this point the waste is carried by a closed concrete box conduit into New River.

RECORDS: During 1986 the mean daily flows were computed from the total inflow to the potable water plant as measured at the Parshall flume, less the water pumped to the city and the water used in the maintenance of the plant. The records are obtained and furnished by the State Commission of Public Services of Mexicali. Records available: January 1968 through December 1986.

REMARKS: The plant began operation on September 28, 1963 by the State Commission of Public Services of Mexicali. Before 1968 the flow was small and infrequent. The potable water plant obtains water from the West Main Canal, which is a part of Mexico's system of canals in the Colorado Irrigation System. Excess water discharges into a closed conduit that empties into New River 0.9 mile (1.4 km) upstream of the international boundary.

EXTREMES: Maximum instantaneous discharge, 81.9 second-feet (2.32 m³/sec) on March 26, 1969; minimum instantaneous discharge, zero during several days in the years 1977 through 1986.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.1	0.4	1.1	1.1	0.7	1.8	1.1	0.7	2.1	1.8	1.8	1.8
2	1.8	1.1	1.8	0	1.8	1.8	1.8	2.1	1.8	1.8	0.4	0.4
3	1.8	1.1	1.8	0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
4	1.8	0.4	0.7	1.8	1.8	1.8	1.8	0	1.8	1.8	1.8	1.8
5	1.1	0	1.8	0	1.8	2.1	1.8	1.8	0.7	1.8	1.8	0.7
6	1.8	0.7	1.8	1.8	1.8	1.8	1.8	0	0.7	1.8	1.8	1.8
7	1.8	0.7	1.8	1.8	1.8	1.8	0	1.1	2.5	1.8	1.8	1.8
8	1.8	0.7	1.8	1.8	2.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8
9	1.8	0.7	2.1	1.8	1.8	1.8	1.8	1.1	1.8	0	1.8	1.8
10	1.8	0.4	1.8	1.8	1.8	1.8	1.8	0.7	1.1	1.8	1.8	1.8
11	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0.4	2.1	1.8	1.8	0.4
12	1.8	1.8	1.8	1.8	1.8	1.8	2.1	1.8	1.1	1.8	1.8	1.1
13	1.8	1.8	1.8	1.8	1.8	1.8	2.1	1.1	1.8	1.8	1.8	1.1
14	2.1	1.8	1.8	1.8	1.8	1.8	1.8	1.1	1.8	1.8	0	1.1
15	1.1	0	0	2.1	1.8	1.8	1.8	0	1.8	1.8	1.8	1.1
16	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.1	1.8	1.1	1.8	1.1
17	1.8	1.8	1.8	1.8	1.8	1.1	1.8	1.8	1.8	1.8	0.4	1.1
18	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.1	1.8	2.1	1.8	1.8
19	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.1
20	1.8	1.8	0	1.8	1.8	1.1	1.8	1.8	1.8	1.8	1.1	1.1
21	1.8	1.1	0	1.1	1.8	1.8	1.8	1.8	1.8	1.8	1.1	1.8
22	1.8	1.8	0	1.8	1.8	1.8	1.8	0	1.8	1.8	1.1	0.7
23	0.4	1.8	0.7	2.1	1.8	1.8	1.8	1.8	1.8	1.8	1.1	1.1
24	0	1.8	1.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
25	1.1	1.8	0	1.8	1.8	1.8	1.8	2.1	1.8	1.8	1.8	1.1
26	0.7	1.8	1.8	1.8	1.8	1.8	1.8	2.1	1.8	1.8	1.8	0
27	0.7	1.1	1.8	1.8	0	0	1.8	1.8	1.8	1.8	1.8	0
28	0	1.1	1.8	1.8	1.1	2.1	1.8	1.8	1.8	1.8	1.8	0
29	0	0.7	1.8	1.8	2.1	1.8	1.8	0.7	1.8	1.8	1.8	1.1
30	0.7	0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
31	0.4	0	0	1.1	1.1	0.7	1.8	1.8	1.1	1.1	1.8	1.8
Sum	41.8	34.7	38.8	47.8	52.1	51.4	52.8	40.6	51.7	52.9	46.6	37.7
Current Year 1986									Period 1968-1986			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			14	2.1	124	0	1.4	81.1	169	520	0	
Feb.			111	1.8	15	0	1.1	67.2	102	311	0	
Mar.			9	2.1	115	0	1.1	75.6	212	871	33.6	
Apr.			115	2.1	12	0	1.4	93.2	202	431	89.2	
May			18	2.1	27	0	1.8	101	214	435	46.2	
June			15	2.1	27	0	1.8	101	192	409	21.0	
July			112	2.1	7	0	1.8	103	242	528	0	
Aug.			12	2.1	14	0	1.4	82.7	267	596	77.7	
Sept.			7	2.5	15	0.7	1.8	101	251	589	67.2	
Oct.			18	2.1	9	0	1.8	103	233	507	91.6	
Nov.			11	1.8	14	0	1.4	90.0	204	504	86.7	
Dec.			11	1.8	126	0	1.1	72.9	191	597	32.9	
Yearly				2.5		0	1.4	1,071	2,525	5,359	940	
	Meters		Cubic Meters per Second					Thousands of Cubic Meters				
				0.07		0	0.04	1,321	3,114	6,610	1,160	

☐ Mean daily

! And other days

WASTE WATERS FROM MEXICAN SYSTEM OF CANALS
ENTERING THE UNITED STATES

DESCRIPTION: During 1986 the only flow to the New River in Mexico was waste from the City of Mexicali Potable Water Plant, which discharges into Rivera Drain and then to New River, and drainage water coming from the Colorado River District system of canals that enter the New River below Laguna Xochimilco.

RECORDS: Records of the Potable Water Plant are based on flows measured on a Parshall flume less pumping to the city. Records obtained and furnished by the State Commission of Public Services of Mexicali. Records available: Wisteria Wasteway, January 1951 through 1975; Sifon Wasteway, January 1952 to April 30, 1964; Pueblo Nuevo Wasteway, January 1956 through 1965; and the Potable Water Plant, January 1968 through December 1986.

REMARKS: To obtain data for Sifon and Pueblo Nuevo Wasteways, see bulletins 1 to 6 (1960-1965); and for Wisteria Wasteway, bulletins 1 to 16 (1960-1975). For data on wastes from Potable Water Plant, see page 51 of this bulletin.

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1986	Period 1956-1986		
		Average	Maximum	Minimum
January	81.1	983	8,758	6.3
February	67.2	704	7,281	6.3
March	75.6	495	2,610	21.7
April	93.2	443	3,194	16.1
May	101	304	1,176	9.1
June	101	396	5,670	0
July	103	596	10,251	0
August	82.7	529	4,137	0
September	101	439	3,215	21.0
October	103	580	3,474	8.4
November	90.0	605	3,784	0
December	72.9	949	8,691	0
Yearly	1,071	7,026	27,430	399
	Thousands of Cubic Meters			
	1,321	8,667	33,835	492

SALTON SEA - ELEVATIONS OF WATER SURFACE

DESCRIPTION: Water-stage recorder and staff gage located on the western shore of the Salton Sea, 15.5 miles (24.9 km) northwest of Westmorland, Imperial County, California. The Salton Sea is the sink of a closed basin which has a drainage area of 8,360 square miles (21,652 km²). Zero of the gage is 250.00 feet (76.2 m) below mean sea level, U. S. C. & G. S. datum.

RECORDS: Records of water surface elevations available from November 1904 through 1986. From January 1925 to October 22, 1951, once monthly records of elevations were collected by Imperial Irrigation District from a bench mark at Figtree John's Spring, about 22 miles (35.4 km) northwest along the western shore from the present gage. Since October 24, 1951, a continuous record of gage heights has been obtained by the U. S. Geological Survey at new gaging station published as "Salton Sea near Westmorland, California." The elevation of the old station is at a datum of one foot (0.30 m) higher than that of the present station. All records reported below and the area and capacity table are adjusted to the datum of the present station.

REMARKS: Runoff from the basin, irrigation drainage and waste water from Imperial and Coachella Valleys in the United States, and drainage and waste water from part of the Mexicali Valley in Mexico discharge into the Salton Sea. Water from Mexico enters the United States in the Alamo and New River channels. The bottom of the sea is 277.7 feet (84.6 m) below mean sea level, U. S. C. & G. S. datum.

EXTREMES: Maximum elevation during year, 226.9 feet (69.2 m) below mean sea level. Minimum elevation during year, 228.1 feet (69.5 m) below mean sea level. Extremes for period of record, maximum elevation 195.9 feet (59.7 m) below mean sea level, February 10 to March 29, 1907; minimum elevation since 1906, 251.6 feet (76.7 m) below mean sea level in November 1924.

MEAN DAILY WATER SURFACE ELEVATION IN FEET BELOW MEAN SEA LEVEL - 1986

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	227.7	227.5	227.1	227.0	226.9	227.0	227.1	227.4	227.6	228.1	227.9	227.9
2	227.7	227.5	227.1	226.9	226.9	227.0	227.1	227.4	227.6	228.1	227.9	227.9
3	227.7	227.4	227.1	226.9	226.9	227.0	227.2	227.4	227.6	228.1	227.9	227.9
4	227.7	227.4	227.1	226.9	226.9	227.0	227.2	227.4	227.6	228.1	227.9	227.9
5	227.7	227.4	227.1	226.9	226.9	227.0	227.2	227.4	227.6	228.1	227.9	227.9
6	227.6	227.4	227.1	226.9	226.9	227.0	227.2	227.4	227.6	228.1	227.9	227.9
7	227.6	227.4	227.1	226.9	227.0	227.0	227.2	227.4	227.6	228.1	227.9	227.9
8	227.6	227.4	227.1	226.9	227.0	227.0	227.2	227.4	227.7	228.1	228.0	227.9
9	227.6	227.4	227.1	226.9	227.0	227.0	227.2	227.4	227.7	228.1	228.0	227.9
10	227.6	227.4	227.1	226.9	227.0	227.0	227.3	227.4	227.7	228.0	228.0	227.9
11	227.6	227.4	227.1	226.9	227.0	227.0	227.3	227.4	227.7	227.9	228.0	227.9
12	227.6	227.4	227.0	226.9	227.0	227.0	227.3	227.4	227.8	227.9	228.0	227.9
13	227.6	227.4	227.0	226.9	227.0	227.0	227.3	227.4	227.8	227.9	228.0	227.9
14	227.6	227.3	227.0	226.9	226.9	227.0	227.3	227.4	227.8	227.9	228.0	227.8
15	227.6	227.3	227.0	226.9	226.9	227.0	227.3	227.4	227.8	227.9	228.0	227.8
16	227.6	227.3	227.0	226.9	226.9	227.1	227.3	227.4	227.9	227.9	228.0	227.8
17	227.6	227.3	227.0	226.9	226.9	227.1	227.3	227.4	227.9	228.0	227.9	227.8
18	227.6	227.3	227.0	226.9	226.9	227.1	227.3	227.4	227.9	228.0	227.9	227.8
19	227.6	227.3	227.0	226.9	226.9	227.1	227.3	227.5	227.9	228.0	227.9	227.8
20	227.5	227.2	227.0	226.9	226.9	227.1	227.3	227.5	228.0	228.0	227.9	227.8
21	227.5	227.2	227.0	226.9	226.9	227.1	227.3	227.5	228.0	228.0	227.9	227.8
22	227.5	227.2	227.0	226.9	226.9	227.1	227.3	227.5	228.0	228.0	227.9	227.8
23	227.5	227.2	227.0	226.9	226.9	227.1	227.3	227.5	228.0	227.9	227.9	227.8
24	227.5	227.2	227.0	226.9	226.9	227.1	227.3	227.5	228.0	227.9	227.9	227.8
25	227.5	227.2	227.0	226.9	226.9	227.1	227.4	227.5	228.0	227.9	227.9	227.8
26	227.5	227.2	227.0	226.9	226.9	227.1	227.4	227.5	228.0	227.9	227.9	227.8
27	227.5	227.2	227.0	226.9	226.9	227.1	227.4	227.5	228.0	227.9	227.9	227.8
28	227.5	227.1	227.0	226.9	227.0	227.1	227.4	227.5	228.0	227.9	227.9	227.8
29	227.5		227.0	226.9	227.0	227.1	227.4	227.5	228.0	227.9	227.9	227.8
30	227.5		227.0	226.9	227.0	227.1	227.4	227.5	228.1	227.9	227.9	227.8
31	227.5		227.0	226.9	227.0	227.1	227.4	227.5		227.9		227.8
Avg.	227.6	227.3	227.0	226.9	226.9	227.1	227.3	227.4	227.8	228.0	227.9	227.8

Current Year 1986			Period 1935-1986			Area and Capacity Table		
Month	Ø Extreme Elevation Feet		Elevation Feet			Elevation	Area	Capacity
	High	Low	# Average	# Maximum	! Minimum	Feet Below M.S.L.	Acres	Acres-Feet
Jan.	227.5	227.7	235.95	227.4	249.3	277.7	0	0
Feb.	227.1	227.5	235.64	227.1	248.8	274.0	20,600	25,700
Mar.	227.0	227.1	235.38	227.0	248.6	270.0	62,900	188,700
Apr.	226.9	227.0	235.19	226.9	248.7	266.0	94,600	510,600
May	226.9	227.0	235.17	226.8	248.5	260.0	122,600	1,170,000
June	227.0	227.1	235.32	227.0	248.8	256.0	134,700	1,684,000
July	227.1	227.4	235.49	227.1	249.1	252.0	148,800	2,250,000
Aug.	227.4	227.5	235.67	227.2	249.4	244.0	179,700	3,562,000
Sept.	227.6	228.1	235.86	227.3	249.4	240.0	196,900	4,315,000
Oct.	227.9	228.1	235.94	227.4	249.8	235.0	221,800	5,360,000
Nov.	227.9	228.0	235.96	227.5	250.0	230.0	235,800	6,504,000
Dec.	227.8	227.9	235.84	227.5	249.6	220.0	262,000	8,993,000
						210.0	288,500	11,740,000
						200.0	315,500	14,760,000
Yearly	226.9	228.1	235.62	227.1	250.0			

Ø Mean daily

Mean monthly

! Reading near first day of month

CHEMICAL ANALYSES OF WATER SAMPLES

The tables below are based on bi-annual samples collected and analyzed by the State of California Department of Water Resources. New River samples prior to 1985 collected and analyzed by the U. S. Geological Survey. Beginning December 1971, not all constituents analyzed.

Samples from the Alamo River are taken north of the international boundary at upstream end of box culvert under the All-American Canal. Flow at this point includes drainage flows across international boundary and flows from drain intercepts along toe of south bank of All-American Canal. Samples from New River are taken from the right bank at road bridge 450 feet north of international boundary. Records of sampling extend from April 1951 through 1986.

ALAMO RIVER

1986	Time	Streamflow Mean Daily	Specific Conductance	pH	Hardness, Total (as CaCO ₃)	Sulfate ion (SO ₄) Dissolved	Chloride ion (Cl) Dissolved	Solids Dissolved (Calculated)
Date	Std.	Sec.-Ft.	Micromhos	Units	mg/L	mg/L	mg/L	
Mar. 25	1215	4.07	4,800	7.7	958	855	978	3,210
June 10	1255	2.75	4,060	7.8	825	735	856	2,710
Sep. 16	1445	1.74	5,280	7.8	971	916	1,040	3,380
Dec. 16	1435	3.65	4,230	7.8	806	843	782	2,840

NEW RIVER

1986	Time	Streamflow Mean Daily	Specific Conductance	pH	Hardness, Total (as CaCO ₃)	Sulfate ion (SO ₄) Dissolved	Chloride ion (Cl) Dissolved	Solids Dissolved (Calculated)
Date	Std.	Sec.-Ft.	Micromhos	Units	mg/L	mg/L	mg/L	mg/L
Mar. 19	1115	388	6,690	7.7	934	676	1,770	4,230
Dec. 16	1400	366	4,320	7.9	734	547	990	2,690

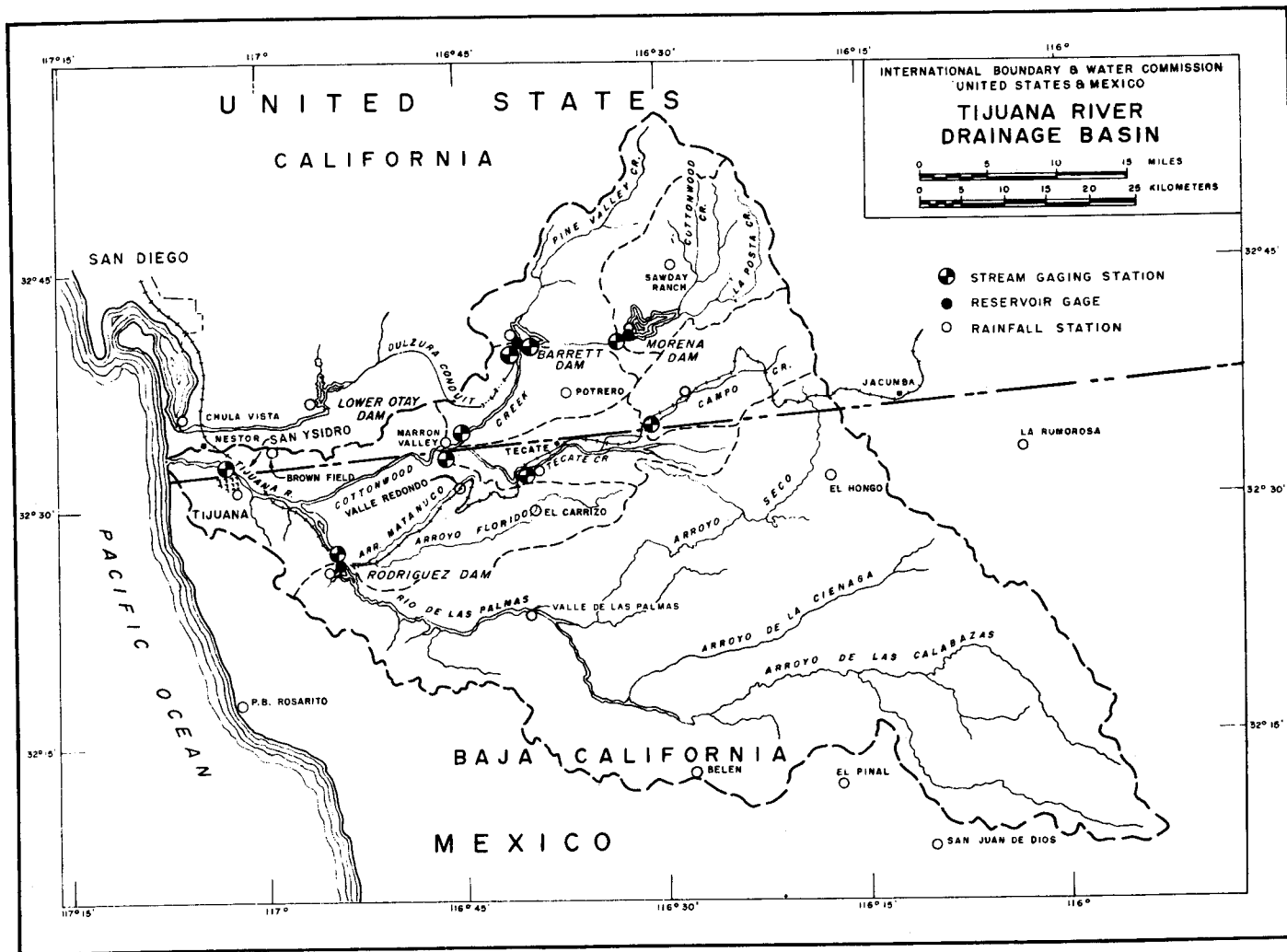
SPECIFIC CONDUCTANCE OF WATER SAMPLES

The following table shows specific conductance of individual water samples from the New River in Mexico at the international boundary. Samples were taken by the Mexican Section of the Commission, who also made the determinations.

NEW RIVER AT INTERNATIONAL BOUNDARY

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1986

January	February	April	June	July	September	November
8 2,780	19 3,560	9 3,180	4 3,130	30 2,010	17 2,040	5 1,960
15 3,230	26 5,620	16 4,150	11 4,540	August	23 2,000	12 1,700
22 2,480	March	23 2,700	18 1,840	6 2,110	October	19 1,850
29 4,050	5 4,850	30 2,370	25 1,540	13 1,810	1 1,960	26 2,150
February	12 3,550	May	July	20 1,920	8 1,970	December
5 3,320	19 3,040	7 2,170	2 2,090	27 1,750	15 1,800	3 1,790
12 3,980	26 4,660	14 4,390	9 2,800	September	22 1,520	10 2,200
	April	21 2,320	16 3,040	3 2,090	29 1,800	17 2,200
	2 3,140	28 4,420	23 1,930	10 1,710		27 3,000



COTTONWOOD CREEK ABOVE MORENA DAM, CALIFORNIA

DESCRIPTION: Staff gage located on east side of outlet tower immediately upstream from face of Morena Dam. The dam is located on Cottonwood Creek 1.8 miles (2.9 km) upstream from the mouth of Hauser Creek, 8.5 miles (13.7 km) upstream from Barrett Dam, and about 20 miles (32.2 km) upstream from the international boundary. The zero of the gage is 2,882.4 feet (878.56 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Reservoir inflows shown below were computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, and rainfall, by the International Boundary and Water Commission, United States Section. They represent all water reaching Morena Reservoir, including rainfall on reservoir water surface. Basic data were furnished by the city of San Diego, California. Records April 1911 through 1986.

REMARKS: Storage began in Morena Reservoir March 1910. Reservoir capacity and area ratings date from 1910 when Morena Dam was completed. Records for 1986 computed on basis of area-capacity curves determined from 1948 resurvey. Various changes have been made to the spillway section since construction of the dam. Elevation of the present crest of ungated spillway is 157.00 feet (47.85 m), gage datum. Reservoir capacity at spillway crest, 1948 survey, is 50,210 acre-feet (61,934,000 m³). The entire capacity of Morena Reservoir is used to furnish a part of the water supply of the city of San Diego, California. Water is released from Morena Reservoir down Cottonwood Creek to Barrett Reservoir as required.

EXTREMES: Maximum monthly inflow since 1937, 45,274 acre-feet (55,845,000 m³), March 1983. Prior to 1937, maximum monthly inflow, 37,200 acre-feet (45,886,000 m³), January 1916; minimum no flow during parts of many years.

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1986	Period 1937-1986		
		Average	Maximum	Minimum
January	343	696	7,472	0
February	1,742	2,111	33,569	8.0
March	2,821	3,121	45,274	19.3
April	545	1,753	23,130	3.3
May	134	888	15,113	0
June	0	454	8,247	0
July	2.6	304	6,203	0
August	237	261	7,228	0
September	120	175	5,133	0
October	241	154	3,905	0
November	303	265	4,567	0
December	558	705	7,679	4.4
Yearly	7,047	10,887	143,966	121
	Thousands of Cubic Meters			
	8,692	13,429	177,579	149

COTTONWOOD CREEK BELOW MORENA DAM, CALIFORNIA

DESCRIPTION: Two water-stage recorders, one on the upstream side of the southeast abutment of Morena Dam for measuring head on the spillway crest and one immediately below the dam with a rectangular control weir for measuring ordinary reservoir releases, and cableway located about 0.8 mile (1.3 km) downstream from the dam. Discharge measurements made at the cableway include leakage, controlled releases, and spillway discharges.

RECORDS: Monthly records shown below represent the water available immediately below Morena Dam, consisting of spillway waste, draft, and leakage from the dam. They are computed by the International Boundary and Water Commission, United States Section, from basic data furnished by the city of San Diego, California. Records available: January 1911 through 1986.

REMARKS: Flows at this station are regulated by Morena Dam; storage began March 1910. Water is released from Morena Reservoir as required and flows down the natural channel of Cottonwood Creek to Barrett Reservoir. There are no major diversions above Morena dam.

EXTREMES: Maximum monthly discharge since 1937, 45,088 acre-feet (55,615,000 m³) March 1983. Prior to 1937, maximum monthly discharge, 21,400 acre-feet (26,397,000 m³), February 1916; minimum, no flow during several months of various years.

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1986	Period 1937-1986		
		Average	Maximum	Minimum
January	350	189	2,094	0
February	316	900	15,926	0
March	350	1,765	45,088	0
April	339	1,383	22,829	0
May	350	713	14,674	0
June	339	510	7,507	0
July	583	313	5,056	0
August	583	296	6,435	0
September	583	343	5,880	0
October	583	184	3,761	0
November	583	212	4,111	0
December	583	428	7,377	0
Yearly	5,542	7,236	136,550	0
	Thousands of Cubic Meters			
	6,836	8,925	168,432	0

COTTONWOOD CREEK ABOVE BARRETT DAM, CALIFORNIA

DESCRIPTION: Staff gage located immediately upstream from face of dam on west side of outlet tower. Barrett Dam is located on Cottonwood Creek 8.5 miles (13.7 km) downstream from Morena Dam, 1 mile (1.6 km) downstream from the mouth of Pine Valley Creek, and about 12 miles (19.3 km) upstream from the international boundary. Zero of gage is 1,446.12 feet (440.78 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Records reported below represent all water reaching Barrett Dam from the sub-basin below Morena Dam, including rainfall on the reservoir water surface. Leakage, releases, and spills from Morena Reservoir are not included. The inflows were computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, and rainfall furnished by the city of San Diego, California. Records available: January 1921 through 1986. Records of stream flow for a station at the dam site are also available for the periods 1906-1915 and 1917-1920.

REMARKS: Storage began at Barrett Reservoir in January 1921. The area-capacity-elevation curves used in the inflow calculations are dated 1948, 1951, and 1955 and were furnished by the city of San Diego, California. Capacity of reservoir at top of flash gates on spillway (gage height 168.88 feet (51.47 m)) is 44,755 acre-feet (55,205,000 m³). Capacity at spillway crest (gage height 160.88 feet (49.04 m)) is 37,950 acre-feet (46,811,000 m³). Dead storage, 719 acre-feet (887,000 m³) below lowest outlet (gage height (58.88 feet) (17.95 m) is included in these capacities. The entire capacity of Barrett Reservoir is used to furnish a part of the water supply of the city of San Diego, California.

EXTREMES: Maximum monthly discharge since 1937, 54,755 acre-feet (67,540,000 m³) February 1980. Prior to 1937, maximum monthly discharge, 54,800 acre-feet (67,595,000 m³) February 1927; minimum, no flow during several months of various years.

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1986	Period 1937-1986		
		Average	Maximum	Minimum
January	570	785	4,926	5.2
February	2,380	2,796	54,755	7.6
March	3,511	4,425	45,700	14.1
April	796	2,075	21,630	10.2
May	577	856	8,311	0
June	340	370	3,906	0
July	249	201	1,687	0
August	365	123	596	0
September	468	128	759	0
October	471	99.0	645	.1
November	242	191	1,241	0
December	284	568	5,549	1.7
Yearly	10,253	12,617	114,330	129
	Thousands of Cubic Meters			
	12,647	15,563	141,024	159

DULZURA CONDUIT BELOW BARRETT DAM, CALIFORNIA

DESCRIPTION: Water-stage recorder 0.5 mile (0.8 km) downstream from Barrett Dam on right bank of Dulzura Conduit 50 feet (15.2 m) upstream from road crossing to Barrett Dam. Elevation of gage has not been determined.

RECORDS: Computed on basis of head on control section of flume, as measured by water-stage recorder, and rating curve determined from current meter measurements. Records obtained and furnished by the city of San Diego, California. Records available: January 1909 through 1986.

REMARKS: Barrett Dam was completed in 1921. Prior to this date the intake of Dulzura Conduit was located 1.5 miles (2.4 km) upstream. The conduit carries diversions from Barrett Reservoir on Cottonwood Creek westerly across the divide into Otay Reservoir for municipal use by the city of San Diego. Prior to September 30, 1958, station was located 8 miles (12.9 km) along the conduit from Barrett Dam, being reported as "Dulzura Conduit near Dulzura;" and the draft from Barrett Reservoir was computed from the discharges obtained at the conduit gaging station, multiplied by the factor 1.05 to allow for channel loss in the reach from the reservoir to the gaging station.

EXTREMES: Since 1937: Maximum mean daily discharge, 55 second-feet (1.56 m³/sec) on March 15, 1954; minimum discharge, no flow for long periods on many occasions.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	26.1	26.5	21.6	0	29.4	29.0	27.1	27.3	28.6	29.6	26.9	26.1
2	26.3	26.3	21.6	0	29.4	29.0	27.3	27.3	28.8	28.6	26.5	26.1
3	26.3	26.3	21.6	0	29.2	29.0	27.3	27.3	28.8	28.4	26.5	26.1
4	26.3	26.3	21.6	0	29.2	29.0	27.3	27.3	29.2	28.4	26.3	26.1
5	26.5	26.1	21.6	0	29.0	28.8	27.5	27.3	29.6	28.4	26.3	25.9
6	27.1	26.3	21.6	0	28.8	28.8	27.5	27.5	29.6	28.4	26.3	25.9
7	26.7	26.1	21.6	0	28.8	28.8	27.5	27.3	29.2	28.2	26.3	25.9
8	26.7	26.1	21.2	0	28.8	28.8	27.8	27.8	29.4	28.0	26.5	25.7
9	26.7	26.1	22.7	0	28.6	28.6	27.8	27.8	29.4	27.8	26.3	25.7
10	28.0	26.1	23.1	0	28.6	28.6	27.8	28.0	29.4	27.8	26.3	25.7
11	29.0	25.9	0	0	28.8	28.6	27.8	28.0	29.4	28.0	26.3	25.5
12	26.9	25.9	0	0	28.8	28.4	27.8	28.4	29.6	28.0	26.3	25.5
13	27.3	25.9	0	0	28.8	28.2	27.8	29.6	29.8	27.8	26.3	25.5
14	27.3	25.9	0	0	28.8	28.2	27.8	30.3	29.8	27.8	26.3	25.1
15	28.0	26.3	0	0	28.6	28.0	27.8	30.7	30.1	27.3	26.3	25.3
16	28.8	26.7	0	0	28.4	27.8	27.8	31.3	30.1	27.3	26.3	25.3
17	28.8	27.1	0	10.9	28.4	27.8	27.8	29.6	30.1	27.3	26.3	25.3
18	29.0	27.1	0	10.9	28.4	27.5	28.0	30.1	30.1	27.3	26.3	25.5
19	26.7	27.1	0	22.7	29.8	27.5	28.0	30.3	30.1	27.3	26.3	25.5
20	26.7	27.8	0	22.3	29.6	27.5	28.4	30.3	30.1	27.3	26.3	25.5
21	27.1	27.8	0	22.5	29.8	27.5	28.0	30.3	29.8	27.3	26.3	25.5
22	26.9	28.0	0	22.3	29.6	27.5	28.0	29.8	29.8	27.1	26.3	25.5
23	26.7	28.0	0	22.3	29.6	27.5	28.4	29.0	29.6	27.3	26.3	25.5
24	26.5	27.5	0	22.3	29.6	27.5	28.2	29.0	29.6	27.1	26.3	25.3
25	26.5	27.8	0	22.3	29.6	27.3	28.4	29.0	29.2	27.1	26.3	25.3
26	26.7	28.0	0	30.1	29.6	27.1	28.4	29.0	29.2	26.7	26.3	25.3
27	26.5	28.2	0	30.1	29.4	27.1	28.4	29.0	29.0	26.7	26.1	25.3
28	26.3	28.4	0	29.8	29.4	27.1	27.8	29.0	29.0	26.9	26.1	25.1
29	26.3		0	29.8	29.0	27.1	27.8	28.8	29.8	26.7	26.1	25.1
30	26.3		0	29.6	29.2	27.1	27.8	28.8	29.6	26.7	26.1	25.1
31	26.5		0		29.2		27.5	28.6		26.7		25.1
Sum	837.5	751.6	218.2	327.9	902.2	840.7	862.6	893.8	885.8	855.3	789.4	791.3
Current Year 1986										Period 1937-1986		
Month	Extreme Gage Feet		Extreme Second-Feet	Average Second-Feet		Total Acre-Feet	Acre-Feet					
	High	Low	Day	High	Low		Average	Maximum	Minimum			
Jan.			111	29.0	1	26.1	27.0	1,661	380	2,350	0	
Feb.			28	28.4	111	25.9	26.8	1,491	425	2,130	0	
Mar.			10	23.1	111	0	7.0	433	545	2,330	0	
Apr.			126	30.1	1	0	10.9	650	796	2,860	0	
May			119	29.8	116	28.4	29.1	1,789	935	3,040	0	
June			1	29.0	126	27.1	28.0	1,668	972	2,920	0	
July			120	28.4	1	27.1	27.8	1,711	850	2,920	0	
Aug.			16	31.3	1	27.3	28.8	1,773	796	2,820	0	
Sept.			115	30.1	1	28.6	29.5	1,757	629	2,320	0	
Oct.			1	29.6	126	26.7	27.6	1,696	516	2,450	0	
Nov.			1	26.9	127	26.1	26.3	1,566	548	2,760	0	
Dec.			1	26.1	114	25.1	25.5	1,570	492	2,305	0	
				31.3		0	24.5	17,765	7,884	27,170	0	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				0.89		0	0.69	21,913	9,725	33,514	0	

0 Mean daily

1 And other days

COTTONWOOD CREEK BELOW BARRETT DAM, CALIFORNIA

DESCRIPTION: Water-stage recorder and cableway located about 2.5 miles (4.0 km) downstream from Barrett Dam and 0.5 mile (0.8 km) upstream from Rattlesnake Canyon for measuring Barrett Dam spills; and staff gage and control weir located immediately below the dam for measuring leakage. The elevation of the gage is about 1,000 feet (305 m) (from topographic map).

RECORDS: Data furnished by the city of San Diego, California. Prior to January 1953, the records were furnished by the city of San Diego and reviewed and revised by the United States Section of the Commission. The recorder is to be operated only when Barrett Reservoir is near or above spillway level. Spillway discharges have occurred in May 1943, March, April 1979, January to May of 1980, April, December 1982, and the entire year of 1983. Spillway discharges included in the period record below were computed by the city of San Diego from the head on the spillway crest, read on the reservoir gage, and applied to a broad-crested weir formula. Records available: January 1921 through 1986. Storage began in Barrett Reservoir in January 1921.

REMARKS: Records reported below represent the water available in the natural channel of Cottonwood Creek immediately below Barrett Dam. Records of draft from Barrett Reservoir are not included, inasmuch as all releases are made to Dulzura Conduit, which transports water outside the basin. Leakage is mainly through the spillway gates.

EXTREMES: Maximum monthly discharge since 1937, 90,618 acre-feet (111,775,000 m³) March 1983. Prior to 1937, maximum monthly discharge 38,400 acre-feet (47,366,000 m³) February 1927; minimum, no flow during several months of various years.

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1986	Period 1937-1986		
		Average	Maximum	Minimum
January	0	202	6,048	0
February	0	1,893	70,318	0
March	0	3,631	90,618	0
April	0	2,070	36,820	0
May	0	877	22,933	0
June	0	400	10,947	0
July	0	148	4,306	0
August	0	100	3,410	0
September	0	9.2	298	0
October	0	4.0	123	0
November	0	83.8	4,135	0
December	0	129	4,911	0
Yearly	0	9,547	206,002	0
	Thousands of Cubic Meters			
	0	11,776	254,099	0

COTTONWOOD CREEK ABOVE TECATE CREEK NEAR DULZURA, CALIFORNIA

DESCRIPTION: Water-stage recorder and cableway located 1.6 miles (2.6 km) upstream from the international land boundary between the United States and Mexico, 0.8 mile (1.3 km) upstream from the confluence with Tecate Creek, and 5.1 miles (8.2 km) south of Dulzura, California. Low water discharge measurements are made by wading at the gage; high water measurements are made from the cableway, which is located 700 feet (213 m) downstream from the gage. Zero of the gage is 569.40 feet (173.55 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on a continuous record of gage heights and current meter measurements or observation of no flow. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through 1986.

REMARKS: Flow is largely controlled by Barrett and Morena Reservoirs, 10 (16.1 km) and 18 miles (29.0 km), respectively, upstream from this station.

EXTREMES: Maximum discharge 11,700 second-feet (331 m³/sec) February 21, 1980 (gage height 11.15 feet) (3.40 m). Minimum discharge, no flow during part of each year.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.1	1.6	2.9	5.2	0.21	0	0	0	0	0	0	0.02
2	1.1	1.2	2.8	5.0	.19	0	0	0	0	0	0	.02
3	1.1	1.1	2.5	4.6	.18	0	0	0	0	0	0	.02
4	1.0	1.0	2.3	4.3	.18	0	0	0	0	0	0	.02
5	.94	.91	2.1	4.1	.18	0	0	0	0	0	0	.02
6	.90	.93	2.0	4.2	.21	0	0	0	0	0	0	.02
7	.77	.89	1.9	4.0	.20	0	0	0	0	0	.01	.17
8	.70	2.4	2.3	3.6	.18	0	0	0	0	0	.01	.74
9	.66	2.9	3.0	3.3	.16	0	0	0	0	0	.01	.42
10	.68	1.7	4.5	3.1	.15	0	0	0	0	0	.01	.35
11	.66	1.4	7.4	2.9	.15	0	0	0	0	0	.01	.30
12	.62	1.2	8.1	2.7	.15	0	0	0	0	.02	.01	.27
13	.63	1.2	7.6	2.6	.16	0	0	0	0	.01	.01	.25
14	.77	1.2	8.1	2.3	.18	0	0	0	0	0	.01	.22
15	.79	.46	7.7	1.9	.18	0	0	0	0	0	.01	.22
16	.75	18	17	1.7	.18	0	0	0	0	0	.01	.22
17	.75	11	28	1.5	.15	0	0	0	0	0	.01	.22
18	.74	8.6	18	1.3	.13	0	0	0	0	0	.02	.23
19	.74	7.7	14	.98	.11	0	0	0	0	0	.02	.27
20	.75	7.0	12	.75	.09	0	0	0	0	0	.02	1.3
21	.75	6.2	10	.62	.10	0	0	0	0	0	.02	.98
22	.75	5.3	9.3	.51	.13	0	0	0	0	0	.02	.52
23	.75	4.6	8.6	.45	.14	0	0	0	0	0	.02	.45
24	.74	4.2	7.9	.43	.14	0	0	0	0	0	.02	.45
25	.71	3.9	7.3	.39	.13	0	0	0	0	0	.02	.43
26	.67	3.7	6.8	.39	.10	0	0	0	0	0	.02	.40
27	.63	3.2	6.2	.34	.46	0	0	0	0	0	.02	.42
28	.56	3.0	6.1	.28	0	0	0	0	0	0	.02	.43
29	.55	5.9	5.9	.24	0	0	0	0	0	0	.02	.42
30	1.6	5.5	5.5	.22	0	0	0	0	0	0	.02	.42
31	1.8	5.2	5.2	0	0	0	0	0	0	0	0	.45
Sum	25.66	152.03	233.0	63.90	4.52	0	0	0	0	0.03	0.37	10.67
Current Year 1986									Period 1937-1986			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			31	1.8	29	0.55	0.83	50.9	507	11,918	0	
Feb.			15	.46	7	.89	5.4	302	2,461	69,019	0	
Mar.			17	28	7	1.9	7.5	462	3,967	88,707	0	
Apr.			1	5.2	30	.22	2.1	127	2,381	40,240	0	
May			27	.46	128	0	.15	9.0	859	18,192	0	
June			1	0	1	0	0	0	284	5,919	0	
July			1	0	1	0	0	0	76.2	2,918	0	
Aug.			1	0	1	0	0	0	59.9	1,500	0	
Sept.			1	0	1	0	0	0	15.2	645	0	
Oct.			12	.02	1	0	0	.1	8.1	236	0	
Nov.			18	.02	1	0	.01	.7	43.5	1,117	0	
Dec.			20	1.3	1	.02	.34	21.2	174	2,569	0	
Yearly				46		0	1.3	973	10,836	178,808	0	
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters				
				1.30		0	0.04	1,200	13,366	220,556	0	

§ Mean daily

! And other days

CAMPO CREEK NEAR CAMPO, CALIFORNIA

DESCRIPTION: Water-stage recorder and broad-crested weir on left bank, 0.5 mile (0.8 km) upstream from the international land boundary between the United States and Mexico, just upstream from the bridge on California State Highway 94, 3.5 miles (5.6 km) southwest of Campo, California. Zero of gage is 2,178.92 feet (664.13 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on current meter measurements and observation of no flow. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through 1986.

REMARKS: Campo Creek originates in the United States and flows southwestward into Mexico where it joins Tecate Creek. The flow at this station was partially regulated by a small conservation reservoir, 1 mile (1.6 km) upstream, from August 1956 to February 20, 1980, when it was destroyed by a flood.

EXTREMES: Maximum discharge, 895 second-feet (25.3 m³/sec), March 24, 1983 (gage height 5.39 feet (1.64 m) present datum), from rating curve extended above 110 second-feet 3.12 m³/sec) on basis of velocity-depth relation and cross section area at the control. Minimum discharge, no flow during part of most years.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.6	6.8	5.1	5.2	1.5	0.63	0.24	0	0	0.22	0.23	0.18
2	4.6	6.1	5.1	5.3	1.3	.61	.22	0	0	.24	.23	.18
3	4.8	5.3	5.0	5.1	1.2	.59	.22	0	0	.24	.23	.19
4	4.6	5.7	4.7	4.7	1.2	.57	.23	0	0	.22	.22	.19
5	4.6	5.6	4.5	5.2	1.3	.56	.27	0	0	.22	.22	.19
6	4.9	5.2	4.3	6.4	1.4	.55	.27	0	0	.22	.23	.27
7	4.4	5.2	4.3	7.1	1.3	.55	.25	0	0	.22	.23	.43
8	4.0	28	4.8	6.2	1.3	.56	.23	0	0	.22	.22	.72
9	4.0	14	8.9	5.8	1.2	.52	.20	0	0	.50	.21	1.0
10	4.0	7.1	16	5.6	1.1	.51	.20	0	0	.70	.20	.96
11	4.0	6.1	32	5.4	1.0	.50	.21	0	0	.34	.20	.90
12	3.8	5.7	13	5.6	1.1	.50	.20	0	0	.28	.21	.89
13	3.8	5.5	12	5.9	1.1	.49	.17	0	0	.25	.21	.87
14	4.2	5.5	12	4.8	1.0	.48	.18	0	0	.23	.21	.91
15	4.9	121	9.6	4.2	1.0	.51	.27	0	0	.23	.21	.86
16	4.6	70	15	3.9	.96	.51	0	0	0	.23	.21	.71
17	4.3	15	28	3.6	.84	.38	0	0	0	.24	.24	.65
18	4.3	11	13	3.0	.75	.31	0	0	0	.24	.26	.59
19	4.0	9.5	10	2.7	.70	.31	0	0	0	.24	.20	.58
20	4.1	8.7	7.8	2.5	.69	.30	0	0	0	.23	.19	.65
21	4.3	7.3	7.0	2.3	.76	.31	0	0	0	.23	.19	1.2
22	4.2	6.0	6.6	2.2	.78	.31	0	0	0	.23	.19	1.3
23	4.0	5.3	6.8	2.1	.78	.33	0	0	0	.25	.18	1.4
24	4.0	5.3	6.2	2.1	.73	.30	0	0	0	.24	.18	1.6
25	3.8	5.3	6.0	2.1	.64	.28	0	0	0	.23	.18	1.6
26	3.7	5.4	5.6	2.1	.63	.25	0	0	0	.23	.18	1.6
27	3.7	5.2	5.0	2.0	.64	.22	0	0	0	.23	.18	1.7
28	3.8	5.2	4.9	1.8	.61	.25	0	0	0	.22	.18	1.8
29	3.8		5.2	1.7	.61	.28	0	0	0	.23	.18	1.6
30	7.8		5.2	1.6	.61	.27	0	0	0	.23	.18	1.5
31	9.1		5.1		.62		0	0	0	.24		1.6
Sum	138.7	392.0	278.7	118.2	29.35	12.74	3.36	0	0	8.07	6.18	28.82
Current Year 1986									Period 1937-1986			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			31	9.1	126	3.7	4.5	275	184	1,087	0	
Feb.			15	121	16	5.2	14	778	382	4,287	0	
Mar.			11	32	16	4.3	9.0	553	642	9,394	0	
Apr.			7	7.1	30	1.6	3.9	234	440	7,204	0	
May			1	1.5	128	.61	.95	58.2	208	3,207	0	
June			1	.63	27	.22	.42	25.3	99.2	1,811	0	
July			15	.27	116	0	.11	6.7	58.3	1,236	0	
Aug.			1	0	1	0	0	0	59.6	1,628	0	
Sept.			1	0	1	0	0	0	43.2	984	0	
Oct.			10	.70	1	.22	.26	16.0	51.7	879	0	
Nov.			18	.26	123	.18	.21	12.3	99.5	1,234	0	
Dec.			28	1.8	1	.18	.93	57.2	160	1,583	0	
				121		0	2.8	2,016	2,428	31,325	0	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				3.43		0	0.08	2,487	2,995	38,639	0	

0 Mean daily

1 And other days

COTTONWOOD CREEK NEAR INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder and cableway, 0.6 mile (1.0 km) upstream from the international land boundary between the United States and Mexico, 0.5 mile (0.8 km) downstream from the confluence of Cottonwood Creek and Tecate Creek, and 5.5 miles (8.9 km) south of Dulzura, California. This station is published by the U. S. Geological Survey under the name "Tijuana River near Dulzura, California." Low water discharge measurements are made by wading at the gage. The zero of the gage is 542.42 feet (165.33 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on a continuous record of gage heights and current meter measurements or observation of no flow. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through 1986.

REMARKS: Flow is partially controlled by Barrett and Morena Reservoirs, 11 (17.7 km) and 19 miles (30.6 km), respectively, upstream from this station. The flow at this station represents the amount of water passing the Marron Dam site.

EXTREMES: Maximum discharge, 13,600 second-feet (385 m³/sec), March 3, 1983 (gage height 7.03 feet); (2.14 m); maximum gage height, 11.19 feet (3.41 m) February 18, 1980; minimum discharge, no flow for part of most years.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	15	9.7	8.5	7.3	1.3	0.16	0.34	0	0	1.1	2.6	3.2
2	13	6.7	8.3	7.3	.99	.12	.25	0	0	1.5	2.8	3.8
3	14	6.4	7.9	6.1	1.0	.13	.22	0	0	1.8	2.8	4.4
4	14	7.2	7.6	6.1	1.4	.14	.20	0	0	2.1	2.9	4.3
5	14	6.2	7.1	5.7	1.4	.14	.26	0	0	2.2	3.0	4.4
6	13	6.0	6.3	5.6	1.3	.14	.27	0	0	1.7	3.2	5.3
7	11	5.2	6.0	5.4	1.5	.18	.24	0	0	1.5	3.7	6.5
8	9.4	17	7.4	5.1	1.5	.23	.24	0	0	1.7	4.0	6.8
9	9.5	16	9.8	5.1	1.1	.23	.23	0	0	2.3	3.5	6.4
10	9.3	8.5	36	5.1	.99	.19	.17	0	0	51	2.6	6.0
11	8.2	7.3	88	5.1	1.0	.20	.16	0	0	18	2.1	5.7
12	7.2	5.8	38	4.8	.99	.23	.20	0	0	5.7	2.2	4.9
13	7.3	6.0	27	4.7	.98	.23	.15	0	0	2.5	2.3	4.7
14	7.4	5.3	26	4.9	.99	.32	.13	0	0	2.1	2.5	4.6
15	7.3	306	19	4.7	.70	.32	.15	0	0	2.3	2.6	3.8
16	7.1	259	78	4.7	.25	.27	0	0	0	2.9	2.8	3.7
17	6.6	78	195	4.1	.12	.33	0	0	0	3.6	2.5	3.8
18	6.4	28	64	3.1	.07	.31	0	0	0	4.2	2.6	3.3
19	5.9	17	37	1.8	.06	.22	0	0	0	4.5	2.7	3.3
20	5.4	14	30	2.2	.06	.18	0	0	0	3.3	2.6	11
21	5.0	13	23	2.1	.09	.18	0	0	0	5.0	2.4	9.5
22	4.9	12	19	1.9	.11	.27	0	0	0	6.2	2.4	7.5
23	4.2	11	18	1.4	.11	.38	0	0	0	4.4	2.0	6.8
24	3.9	10	17	1.3	.14	.46	0	0	0	3.6	1.7	6.6
25	4.0	9.9	15	2.0	.18	.39	0	0	0	3.2	2.0	6.3
26	3.5	9.2	13	1.9	.20	.36	0	0	0	3.1	2.3	6.0
27	3.1	9.0	10	1.6	.20	.31	0	0	0	2.8	2.2	6.2
28	3.0	8.5	9.8	1.0	.19	.26	0	0	0	2.9	2.9	6.2
29	3.5		8.5	1.2	.18	.27	0	0	0	3.0	4.0	6.2
30	10		7.9	1.2	.16	.24	0	0	0	3.1	3.9	6.2
31	9.1		7.7		.15		0	0	0	2.9		6.6
Sum	245.2	897.9	855.8	114.5	19.41	7.39	3.21	0	0	156.2	81.8	174.0
Current Year 1986										Period 1937-1986		
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			1	15	28	3.0	7.9	486	1,009	20,792	0	
Feb.			15	306	7	5.2	32	1,781	4,594	143,486	0	
Mar.			17	195	7	6.0	28	1,697	6,888	133,180	0	
Apr.			1	7.3	28	1.0	3.8	227	3,282	51,060	0	
May			1	1.5	119	.06	.63	38.5	1,114	20,955	0	
June			24	.46	2	.12	.25	14.7	392	8,428	0	
July			1	.34	116	0	.10	6.4	158	3,497	0	
Aug.			1	0	1	0	0	0	160	5,494	0	
Sept.			1	0	1	0	0	0	48.2	1,144	0	
Oct.			10	51	1	1.1	5.0	310	76.5	1,626	0	
Nov.			18	4.0	24	1.7	2.7	162	192	3,568	0	
Dec.			20	11	1	3.2	5.6	345	568	5,839	0	
				306		0	7.0	5,068	18,482	288,517	0	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				8.67		0	0.20	6,251	22,797	355,880	0	

§ Mean daily

! And other days

INFLOWS TO RODRIGUEZ RESERVOIR, BAJA CALIFORNIA

DESCRIPTION: Rodriguez Dam is located in Mexico on Rio de las Palmas, the principal tributary to the Tijuana River, about 5.6 miles (9.0 km) upstream from its confluence with Cottonwood Creek, 10.6 miles (17.0 km) upstream from the point where the Tijuana River crosses the international boundary between the United States and Mexico, and 9.9 miles (16.0 km) southeast of Tijuana, Baja California.

RECORDS: Computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, and rainfall. Records obtained by the Ministry of Agriculture and Hydraulic Resources through May 1961; from June 1961 through March 1966 by the Junta de Agua Potable y Alcantarillado del Distrito Urbano de Tijuana, Baja California, and from April 1966 by the State of Baja California Commission of Public Services for Tijuana. Records furnished by the Mexican Section of the Commission. Records available: May 1937 through 1986. Storage began in Rodriguez Reservoir on September 22, 1936.

REMARKS: Records of runoff represent all water reaching Rodriguez Reservoir, including rainfall on the reservoir water surface. Area-capacity-elevation rating for reservoir used in the computations is dated 1927 when the reservoir area was initially surveyed. Elevation of crest of spillway 380.08 feet (115.85 m) above mean sea level; at top of spillway gates 410.10 feet (125.00 m) above mean sea level. Reservoir capacity at spillway crest 74,885 acre-feet (92,370,000 m³); at top of spillway gates 111,880 acre-feet (138,000,000 m³). EXTREMES: Maximum monthly inflow, 157,453 acre-feet (194,216,000 m³); February 1980; minimum, no flow during part of most years.

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1986	Period 1938-1986		
		Average	Maximum	Minimum
January	216	2,161	54,820	0
February	2,225	6,203	157,453	5.8
March	4,157	10,598	139,893	4.2
April	396	3,324	77,790	0
May	45.0	649	11,460	0
June	54.5	208	4,661	0
July	1.4	98.9	1,464	0
August	0	58.9	770	0
September	45.9	59.4	466	0
October	217	76.4	344	0
November	183	173	1,940	0
December	263	921	15,686	8.4
Yearly	7,806	24,532	309,298	254
	Thousands of Cubic Meters			
	9,628	30,260	381,515	313

DIVERSIONS FROM RODRIGUEZ RESERVOIR, BAJA CALIFORNIA

DESCRIPTION: Sparling flow meter located immediately below the dam in the pipeline which carries water from Rodriguez Reservoir to Gate No. 1 (Poblado Presa) and to Gate No. 2 (City Aqueduct). Formerly, water for irrigation was also diverted to the North and South Canals.

RECORDS: Direct recording by Sparling flow meter. Records through May 1961 were obtained by the Ministry of Agriculture and Hydraulic Resources; from June 1961 to March 1966 by the Junta de Agua Potable y Alcantarillado del Distrito Urbano de Tijuana; and from April 1966 through 1986 by the State of Baja California Commission of Public Services for Tijuana. Records furnished by the Mexican Section of the Commission. Records available: May 1937 through 1986.

REMARKS: Beginning in January 1937, diversions for irrigation began from both sides for the Tijuana valley and for domestic use at the village by Rodriguez Dam and the city of Tijuana. Since February 1960, no water has been released for irrigation of farmlands.

EXTREMES: Maximum monthly diversion, 1,963 acre-feet (2,421,000 m³), July 1944; minimum, no flow March and April 1941, August 1960, and December 1962.

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1986	Period 1938-1986		
		Average	Maximum	Minimum
January	1,377	336	1,425	1.5
February	1,325	345	1,331	0.8
March	1,501	401	1,501	0
April	1,501	502	1,602	0
May	1,535	636	1,676	1.8
June	1,521	712	1,857	1.9
July	1,596	753	1,963	1.9
August	1,645	694	1,859	0
September	1,527	599	1,527	1.9
October	1,618	541	1,618	1.9
November	1,563	450	1,563	1.9
December	1,596	419	1,596	0
Yearly	18,306	6,388	18,306	29.3
	Thousands of Cubic Meters			
	22,580	7,879	22,580	36.2

TIJUANA RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder on top of north levee about 0.7 mile (1.1 km) downstream (north) from boundary, 1.1 miles (1.8 km) upstream from the new Dairy Mart Road bridge, and 1.4 miles (2.3 km) west of the international gate at San Ysidro, California. Zero of the gage is 38.04 feet (11.59 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on current meter measurements, staff gage readings and record of gage heights. Records obtained and furnished by the United States Section of the Commission. Records available: May 1947 through 1986.

EXTREMES: Since May 1947: Maximum instantaneous discharge, 33,100 second-feet (937 m³/sec), February 21, 1980; minimum discharge, no flow during many years since 1951.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.5	26.9	15.2	14.3	3.4	4.5	3.7	3.6	3.0	4.3	5.2	6.1
2	9.9	14.0	15.9	13.8	3.6	3.9	3.7	3.0	3.2	4.3	5.2	6.2
3	10.2	11.8	16.1	13.4	3.7	3.9	3.6	3.1	2.9	3.3	6.2	6.2
4	12.4	13.1	16.0	12.7	3.4	3.9	3.4	3.4	3.5	3.2	5.6	6.5
5	18.4	12.5	17.1	19.8	3.5	3.9	3.4	3.4	3.9	3.0	5.6	6.2
6	18.7	9.6	17.4	75.5	4.4	3.9	3.7	3.1	3.4	4.0	6.3	32.5
7	16.6	11.2	18.4	19.5	4.9	3.9	3.9	2.9	2.7	3.1	5.4	55.5
8	15.0	96.3	18.4	12.8	3.9	3.9	3.9	3.1	3.1	2.2	5.5	11.3
9	11.6	24.5	19.0	13.2	3.7	3.9	4.2	3.4	2.9	44.8	5.4	7.8
10	8.7	15.1	19.0	15.8	3.7	3.9	4.5	3.4	2.4	336	7.2	7.2
11	8.9	11.8	125	18.4	3.7	3.7	4.5	3.4	1.5	9.4	6.5	6.9
12	8.1	9.5	89.3	15.5	3.4	3.7	4.5	3.4	0.3	7.9	6.3	6.9
13	8.1	9.4	70.9	14.2	3.6	3.9	4.3	3.4	0.1	6.1	6.5	7.1
14	8.1	9.0	78.6	12.2	3.3	3.9	4.7	3.4	0.2	3.6	6.5	7.3
15	8.2	924	52.1	9.6	3.0	4.4	4.2	3.4	1.4	3.5	6.5	6.9
16	10.2	521	456	9.4	3.6	3.9	3.9	3.4	2.8	3.5	6.5	6.4
17	10.2	124	442	7.9	3.9	5.2	3.9	3.6	3.5	3.4	19.6	5.8
18	12.2	85.1	167	7.9	3.7	5.1	4.0	3.4	2.0	2.7	38.6	6.0
19	10.1	69.5	106	8.8	3.6	4.2	3.6	3.4	2.2	2.9	9.7	6.2
20	10.8	37.9	82.6	6.5	4.3	3.9	3.8	3.0	2.2	3.4	8.2	140
21	10.1	36.4	52.8	5.6	7.3	3.9	4.3	2.6	2.1	4.2	7.3	18.0
22	10.6	34.9	34.1	5.2	7.9	3.9	4.5	2.9	2.1	4.8	7.9	8.7
23	10.0	32.0	31.7	4.8	8.2	4.1	4.8	2.9	2.4	5.5	8.1	6.2
24	10.4	29.3	27.4	4.5	6.6	3.9	4.4	2.4	2.9	5.3	8.6	5.3
25	10.6	20.6	22.2	4.5	6.8	3.7	4.2	2.4	181	5.8	8.6	5.8
26	9.6	18.4	17.7	4.5	5.8	3.4	4.5	3.4	3.9	5.5	6.5	6.6
27	10.0	15.2	15.4	4.4	5.3	3.4	4.7	3.4	4.6	5.8	6.2	6.2
28	9.4	14.7	14.2	4.3	4.5	3.4	4.8	2.8	5.1	5.6	7.3	5.7
29	9.3		14.0	4.1	4.5	3.8	4.0	2.4	4.4	5.1	6.8	6.2
30	134		14.3	3.7	4.5	3.9	3.7	2.4	4.6	5.4	6.0	7.2
31	43.1		14.0		5.1		3.6	2.8		5.5		7.3
Sum	493.0	2,237.7	2,270.8	366.8	140.8	118.9	126.9	96.6	260.3	513.1	245.8	428.2
Current Year 1986									Period 1947-1986			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	41.08	39.18	30	931	10	6.5	15.9	978	2,790	72,441	0	
Feb.	42.36	39.17	15	2,500	6	5.8	79.9	4,438	9,606	315,328	0	
Mar.	41.98	39.25	16	1,950	128	13.8	73.3	4,504	13,031	293,494	0	
Apr.	40.75	39.13	6	663	30	3.4	12.2	728	3,365	62,938	0	
May	39.23	39.02	123	9.8	114	0	4.5	279	1,850	42,599	0	
June	39.17	39.14	1	5.2	111	3.4	4.0	236	493	9,696	0	
July	39.19	39.13	18	6.5	130	2.9	4.1	252	356	9,242	0	
Aug.	39.15	39.12	1	3.9	120	2.4	3.1	192	517	17,092	0	
Sept.	41.40	39.09	25	1,230	111	0	8.7	516	93.2	978	0	
Oct.	41.88	39.08	10	1,850	18	0.3	16.6	1,018	119	1,237	0	
Nov.	39.93	39.13	18	174	5	3.9	8.2	488	371	4,377	0	
Dec.	40.95	39.14	20	817	1	4.5	13.8	849	659	6,705	0	
Yearly	42.36	39.02		2,500		0	20.0	14,478	33,250	595,739	0	
Meters			Cubic Meters per Second				Thousands of Cubic Meters					
	12.91	11.89		70.8		0	0.57	17,858	41,013	734,838	0	

* Estimated

II Partly estimated

! And other days

STORED WATER IN RESERVOIRS, TIJUANA RIVER BASIN

Data are presented below for all storage reservoirs in the Tijuana River Basin. The data represent contents on the last day of the month in acre-feet. The reservoir capacities indicated are total capacities at the top of the spillway gates in closed position on the controlled spillways of Barrett and Rodriguez Dams, and at spillway level for Morena Dam, which has had an uncontrolled spillway since the spillway gates were removed in 1942. The records of storage reported below for Morena, Barrett, and Rodriguez Reservoirs are based on the capacities as determined by the following surveys: Morena 1948; Barrett 1948, 1951, and 1955; and Rodriguez 1927, when the reservoir area was initially surveyed.

Records for Morena and Barrett Reservoirs are obtained and furnished by the city of San Diego and the U. S. Geological Survey. Records for Rodriguez Reservoir obtained and furnished by the State of Baja California Commission of Public Services for Tijuana.

IN ACRE-FEET

Month	MORENA RESERVOIR, CALIFORNIA (Capacity 50,210)		BARRETT RESERVOIR, CALIFORNIA (Capacity 44,760)		RODRIGUEZ RESERVOIR, BAJA CALIFORNIA (Capacity 111,880)		TOTAL IN TIJUANA RIVER BASIN RESERVOIRS (Capacity 206,850)	
	1986	Average 1937-1986	1986	Average 1937-1986	1986	Average 1937-1986	1986	Average 1937-1986
Jan.	40,097	18,253	23,620	13,463	43,330	33,841	107,047	65,557
Feb.	41,348	19,359	24,779	14,767	43,900	35,183	110,027	69,309
Mar.	43,476	20,561	27,962	16,687	46,129	39,443	117,567	76,691
Apr.	43,202	20,684	28,234	17,166	44,530	39,653	115,966	77,503
May	42,219	20,530	27,041	16,695	42,430	39,152	111,690	76,377
June	40,857	20,053	25,684	15,928	40,554	38,069	107,095	74,050
July	39,372	19,567	24,351	15,136	38,448	36,651	102,171	71,354
Aug.	38,100	19,096	23,096	14,360	36,272	35,260	97,468	68,716
Sept.	37,017	18,583	22,138	13,930	34,399	34,294	93,554	66,807
Oct.	36,273	18,275	21,353	13,516	32,680	33,487	90,306	65,278
Nov.	35,706	18,184	20,508	13,182	30,977	32,932	87,191	64,298
Dec.	35,504	18,360	19,738	13,475	29,396	33,243	84,638	65,078
Average	39,431	19,292	24,042	14,859	38,587	35,934	102,060	70,085
Maximum	43,476	!# 61,670	28,234	!# 45,920	46,129	! 112,272	117,567	! 213,600
Minimum	35,504	!! 10	19,738	!! 106	29,396	!! 0	84,638	!! 1,264

March 31, 1941 - Prior to removal of spillway gates

! April 30, 1937 - Sandbags were placed on crest of spillway

! Maximum end of month storage for period of record

!! Minimum end of month storage for period of record

RAINFALL ON THE TIJUANA RIVER WATERSHED IN INCHES

Tabulated below are monthly records of rainfall with averages for their periods of record at stations located in California and Baja California. Daily records, where available, are on file in the offices of the United States and Mexican Sections of the Commission. For location, elevation, period of record, and the observer, see alphabetical listing of these stations following rainfall data.

IN THE UNITED STATES

Month	Morena Dam, California		Barrett Dam, California		Marron Valley, California		Potrero, California		Sawday Ranch, California	
	1986	Average 1906-1986	1986	Average 1907-1986	1986	Average 1951-1986	1986	Average 1914-1986	1986	Average 1950-1986
Jan.	0.96	3.74	0.94	3.38	#	2.82	0.79	3.37	0.77	3.31
Feb.	4.57	3.75	3.78	3.41	#	2.18	4.51	3.64	4.61	2.99
Mar.	4.47	3.52	4.96	3.20	5.30	2.94	3.75	3.22	3.01	3.38
Apr.	.33	1.68	.22	1.53	0	1.24	.27	1.72	.34	1.53
May	.03	.61	.03	.54	0	.36	0	.59	0	.41
June	0	.13	0	.07	0	.05	0	.09	0	.05
July	.03	.39	.06	.13	0	.04	.03	.22	.24	.58
Aug.	1.30	.55	0	.24	0	.13	0	.23	.44	.77
Sept.	1.16	.39	1.32	.26	1.30	.28	0	.28	1.37	.46
Oct.	2.37	.88	2.11	.71	1.70	.43	0	.71	1.97	.54
Nov.	.88	1.63	.84	1.49	#	1.45	.50	1.61	.64	1.87
Dec.	1.06	3.17	1.37	2.83	#	2.32	1.50	3.03	.95	2.51
Yearly	17.16	20.44	15.63	17.79		14.24	11.35	18.71	14.34	18.40

Month	Campo, California		Chula Vista, California		Lower Otay Dam, California		Brown Field, California			
	1986	Average 1900-1986	1986	Average 1930-1986	1986	Average 1906-1986	1986	Average 1964-1986		
Jan.	0.75	3.00	2.14	1.82	0.51	2.08	0.62	1.70		
Feb.	3.53	3.22	4.17	1.71	2.62	1.53	2.49	1.45		
Mar.	3.47	2.83	3.12	1.73	1.95	2.20	2.13	2.15		
Apr.	.28	1.39	.46	.81	.54	1.04	.39	.97		
May	.01	.49	#	.23	0	.43	0	.20		
June	0	.07	0	.05	0	.07	0	.06		
July	.35	.52	#	.01	.09	.04	.04	.05		
Aug.	.06	.53	0	.09	0	.12	0	.12		
Sept.	1.32	.36	.90	.18	.88	.23	.71	.19		
Oct.	2.12	.64	#	.39	1.16	.35	.95	.35		
Nov.	.57	1.42	.54	1.21	.54	1.40	.41	1.64		
Dec.	.72	2.47	1.08	1.63	1.44	1.57	1.34	1.74		
Yearly	13.18	16.94		9.86	9.73	11.06	9.08	10.62		

IN MEXICO

Month	La Rumorosa, Baja California		Valle Redondo, Baja California		Tecate, Baja California		Rodríguez Dam, Baja California		Valle de las Palmas, Baja California	
	1986	Average 1945-1986	1986	Average 1971-1986	1986	Average 1946-1959 1961-1986	1986	Average 1938-1986	1986	Average 1948-1986
Jan.	.63	0.94	0.71	2.40	#	2.64	0.75	1.57	0.63	1.65
Feb.	.39	.55	2.20	2.36	3.11	1.89	2.48	1.42	1.61	1.22
Mar.	.87	.75	2.60	2.64	2.91	2.52	2.56	1.65	1.81	1.54
Apr.	T	.31	.31	.87	.12	1.06	0	.75	.08	.59
May	0	.08	0	.28	.04	.31	0	.12	0	.12
June	0	.04	0	.04	0	.12	0	.04	0	.04
July	.28	.43	0	.08	T	.16	T	.04	0	.08
Aug.	.67	.75	#	.20	0	.24	.08	.12	0	.24
Sept.	#	.35	.71	.31	1.06	.16	.67	.24	.31	.20
Oct.	.79	.39	1.46	.63	1.57	.39	1.06	.35	.94	.24
Nov.	.16	.59	.55	1.85	.75	1.46	.47	1.02	.47	.87
Dec.	.35	.79	1.97	1.42	1.42	2.13	1.26	1.54	1.02	1.10
Yearly		5.83		13.31		13.78	9.33	8.78	6.89	7.68

Missing record

T Trace

RAINFALL ON THE TIJUANA RIVER WATERSHED
IN INCHES

IN MEXICO

Month	P. B. Rosarito, Baja California		El Pinal, Baja California		El Hongo, Baja California		El Carrizo, Baja California		Belen, Baja California	
	1986	Average 1967-1986	1986	Average 1964-1986	1986	Average 1980-1986	1986	Average 1980-1986	1986	Average 1965-1986
Jan.	0.79	1.81	1.34	2.95	0.83	1.57	1.10	1.85	0.67	2.44
Feb.	1.93	1.81	4.13	3.46	2.28	2.09	1.54	2.13	3.90	2.68
Mar.	2.13	1.81	5.04	3.78	.63	3.23	1.97	3.03	3.00	2.91
Apr.	.79	.71	.24	1.65	.12	.83	T	.75	.12	1.06
May	0	.24	.04	.39	0	.20	T	.16	0	.20
June	0	.04	0	.04	0	.04	0	.04	0	.08
July	.08	.04	.08	.83	.67	.94	T	.20	.08	.16
Aug.	0	.08	.55	.94	1.50	1.30	0	.16	0	.31
Sept.	.91	.24	.79	.75	.67	.35	.47	.16	.47	.43
Oct.	.79	.39	1.02	.47	1.34	.47	1.02	.43	.71	.55
Nov.	.47	1.30	.63	2.17	.67	2.05	.47	1.73	.59	1.73
Dec.	1.34	1.34	1.26	2.95	.67	1.50	1.77	1.89	1.89	2.13
Yearly	9.21	9.92	15.12	20.43	9.37	15.16	8.35	12.36	11.42	15.16

T Trace

LOCATION OF RAINFALL STATIONS ON THE TIJUANA RIVER WATERSHED

The precipitation records of the stations listed alphabetically below began on the date shown and extend through 1986.

IN THE UNITED STATES

NAME OF STATION	LATI- TUDE	LONGI- TUDE	Ø ELEV. (FT.)	RECORD BEGAN	OBSERVER
Barrett Dam, California	32° 41'	116° 40'	1,623	1907	City of San Diego
Brown Field, California	32° 34'	116° 59'	515	1964	City of San Diego
Campo, California	32° 38'	116° 28'	2,630	1877	Archie C. Leach
Chula Vista, California	32° 36'	117° 06'	9	1930	Western Salt Company
Lower Otay Dam, California	32° 37'	116° 56'	540	1906	City of San Diego
Marron Valley, California	32° 34'	116° 46'	550	1951	County of San Diego
Morena Dam, California	32° 41'	116° 31'	3,075	1906	City of San Diego
Potrero, California	32° 37'	116° 36'	2,400	1914	County of San Diego
Sawday Ranch, California	32° 45'	116° 29'	3,200	1950	William Tulloch

IN MEXICO

NAME OF STATION	LATI- TUDE	LONGI- TUDE	Ø ELEV. (FT.)	RECORD BEGAN	OBSERVER
Belen, Baja California	32° 12'	116° 29'	1,821	1965	* S. A. R. H.
El Carrizo, Baja California	32° 29'	116° 42'	1,624	1980	S. A. R. H.
El Hongo, Baja California	32° 31'	116° 18'	3,150	1980	S. A. R. H.
El Pinal, Baja California	* 32° 11'	116° 17'	* 4,429	1964	S. A. R. H.
La Rumorosa, Baja California	32° 33'	116° 03'	4,042	1945	S. A. R. H.
P. B. Rosarito, Baja California	32° 19'	117° 02'	72	1967	S. A. R. H.
Rodriguez Dam, Baja California	32° 27'	116° 54'	394	1938	S. A. R. H.
Tecate, Baja California	32° 33'	116° 41'	1,575	1946	S. A. R. H.
Valle de Las Palmas, Baja California	32° 22'	116° 37'	919	1948	S. A. R. H.
Valle Redondo, Baja California	32° 31'	116° 45'	794	1971	S. A. R. H.

Ø Elevation above mean sea level

* Ministry of Agriculture and Hydraulic Resources

* Estimated from topographic maps

EVAPORATION IN THE TIJUANA RIVER BASIN IN INCHES

Tabulated below are records of evaporation observed at three stations in California and at four stations in Baja California, with averages for their periods of record. The stations in California are observed by Western Salt Company, city of San Diego, California, and the United States Section of the Commission; those in Baja California are observed by the Ministry of Agriculture and Hydraulic Resources of Mexico. For specific location of these stations, refer to data opposite same station name shown in "Location of Rainfall Stations," page 71 in this bulletin.

Types of pans used:

1. Barrett Reservoir: January 1921 through September 1926, square 3-foot by 3-foot by 18-inch deep floating pan. October 1926 through 1986, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.
2. Morena Reservoir: October 1915 through December 1921, square 3-foot by 3-foot by 18-inch deep floating pan. January 1922 through August 1926 records are the average of evaporation in a square 3-foot by 3-foot by 18-inch deep floating pan and a land pan of the same dimensions. September 1926 through 1986, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.
3. Lower Otay Dam: January 1950 through 1986, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.

IN THE UNITED STATES

Month	Morena Dam, California		Barrett Dam, California		Lower Otay Dam, California			
	1986	Average 1916-1986	1986	Average 1921-1986	1986	Average 1950-1986		
Jan.	2.74	2.11	2.20	1.88	2.62	1.93		
Feb.	1.41	2.15	1.09	2.18	1.97	2.27		
Mar.	2.65	3.29	2.65	3.38	2.72	3.32		
Apr.	3.75	4.64	4.67	4.72	4.80	4.62		
May	6.07	6.50	7.04	6.68	7.14	6.13		
June	7.69	8.37	7.77	8.23	9.37	6.96		
July	7.23	9.61	8.84	9.74	9.51	8.45		
Aug.	7.92	8.92	9.20	9.14	9.03	7.92		
Sept.	4.85	7.08	5.65	7.44	6.43	6.48		
Oct.	3.30	4.95	3.71	5.22	3.35	4.68		
Nov.	2.57	3.23	2.77	3.25	2.73	2.82		
Dec.	1.59	2.31	1.83	2.01	1.83	2.12		
Yearly	51.77	63.16	57.42	63.87	61.50	57.70		

IN MEXICO

Month	Rodriguez Dam, Baja California		Valle Redondo, Baja California		El Carrizo, Baja California			
	1986	Average 1939-1942 1946-1986	1986	Average 1976-1986	1986	Average 1980-1986		
Jan.	4.02	4.29	*	3.31	5.75	5.04		
Feb.	2.60	4.45	2.80	3.07	3.31	4.45		
Mar.	3.62	4.57	3.78	3.94	4.33	5.31		
Apr.	5.43	5.59	6.65	5.83	6.46	7.05		
May	6.34	5.08	8.94	7.48	10.39	8.35		
June	6.89	7.68	9.96	9.69	10.51	11.10		
July	7.32	8.66	11.30	10.35	11.69	11.42		
Aug.	*	*	*	9.69*	12.44	11.02		
Sept.	5.20	6.73	7.64	7.48	7.32	8.86		
Oct.	4.09	5.59	5.51	5.24	6.65	7.76		
Nov.	4.29	4.53	4.80	3.62	7.09	5.35		
Dec.	2.80	3.50	2.91	2.80	4.29	4.29		
Yearly		69.17		73.03	90.08	90.39		

* No record

TEMPERATURE IN THE TIJUANA RIVER BASIN IN DEGREES FAHRENHEIT

The maximum, minimum, and monthly average temperature observations for United States stations are from daily readings of thermometers generally exposed in a shelter located a few feet above sod-covered ground. The maximum and minimum temperatures shown for the stations in Mexico are from daily maximum and minimum thermometer observations, with maximum and minimum for their periods of record. For specific location, elevation, period of record, and the observer, refer to data opposite same station name as shown in "Location of Rainfall Stations," page 71 in this bulletin.

IN THE UNITED STATES

Month	Barrett Dam, California				Campo, California				Chula Vista, California			
	1986			Average 1931- 1986	1986			Average 1951- 1986	1986			Average 1931- 1986
	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	56.1	82	35	49.1	54.7	80	29	47.4	60.9	86	43	53.3
Feb.	52.1	87	29	50.7	51.2	85	21	48.5	58.9	86	39	54.4
Mar.	56.9	88	38	53.2	54.7	85	30	49.7	61.2	85	45	55.7
Apr.	58.7	88	38	57.6	54.9	88	30	53.3	62.1	91	46	58.2
May	63.8	94	37	62.7	60.5	93	31	58.6	■	■	■	60.8
June	71.4	102	49	68.5	67.6	102	37	65.2	67.3	82	59	63.4
July	73.9	101	51	76.2	70.5	102	39	73.2	■	■	■	67.2
Aug.	79.3	104	51	76.3	76.1	103	44	73.2	71.9	93	61	68.8
Sept.	66.7	101	44	72.3	62.1	100	33	68.7	66.8	79	53	67.6
Oct.	61.6	86	43	64.1	58.6	86	34	60.5	■	■	■	63.3
Nov.	57.4	83	37	55.8	54.0	79	29	52.5	62.6	84	44	58.3
Dec.	51.0	80	30	50.6	48.1	82	25	48.0	57.5	79	40	54.6
Yearly	62.4	104	29	61.4	59.4	103	21	58.2				60.5

Month	Potrero, California											
	1986			Average 1975- 1986								
	Mean	Max.	Min.									
Jan.	57.3	83	34	51.2								
Feb.	52.9	92	25	51.8								
Mar.	58.3	94	32	52.4								
Apr.	61.1	90	34	56.8								
May	65.9	100	37	62.1								
June	74.4	105	43	70.3								
July	75.7	104	42	76.9								
Aug.	79.9	106	48	76.3								
Sept.	64.6	102	38	73.0								
Oct.	61.3	89	40	64.3								
Nov.	55.2	81	19	55.7								
Dec.	52.5	81	30	52.1								
Yearly	63.3	106	19	61.9								

IN MEXICO

Month	La Rumorosa, Baja California				Tecate, Baja California				Rodriguez Dam, Baja California			
	1986		1945-1986		1986		1946-1986		1986		1938-1986	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	72	36	81	5	■	■	■	■	86	41	90	27
Feb.	75	21	82	10	88	28	100	18	90	36	93	32
Mar.	77	28	88	16	90	34	97	23	86	43	90	32
Apr.	84	34	91	23	90	36	100	28	93	41	93	36
May	90	37	97	27	99	36	108	36	90	39	100	37
June	100	54	113	34	100	46	108	32	90	50	108	46
July	97	54	104	39	99	48	115	36	93	55	104	46
Aug.	97	61	102	46	104	52	117	34	91	55	106	50
Sept.	■	■	104	34	99	41	115	36	90	46	109	46
Oct.	84	36	95	25	90	41	106	27	86	48	108	34
Nov.	70	27	95	14	88	36	97	27	84	46	99	30
Dec.	79	23	84	10	84	30	97	23	81	39	93	27
Yearly									93	36	109	27

■ Missing data

TEMPERATURE IN THE TIJUANA RIVER BASIN
IN DEGREES FAHRENHEIT

IN MEXICO

Month	Valle de las Palmas, Baja California				P. B. Rosarito, Baja California				El Pinal, Baja California			
	1986		1948-1986		1986		1967-1986		1986		1964-1986	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	86	32	91	12	82	39	93	36	66	27	77	3
Feb.	91	27	99	23	79	43	90	36	81	25	81	14
Mar.	91	36	100	28	84	46	90	34	72	28	84	19
Apr.	93	39	104	28	88	48	88	36	73	28	84	18
May	100	37	111	36	84	46	104	43	77	30	91	25
June	106	43	118	39	84	52	104	43	90	36	99	25
July	104	48	120	45	82	54	90	50	90	39	102	32
Aug.	108	50	118	41	82	57	93	50	95	43	104	32
Sept.	108	41	117	43	75	54	108	48	90	28	102	25
Oct.	100	39	109	32	75	46	100	43	70	34	95	23
Nov.	86	34	100	19	75	50	97	32	66	27	88	14
Dec.	86	36	95	21	75	46	90	36	63	28	79	10
Yearly	108	27	120	12	88	39	108	32	95	25	104	3

Month	Valle Redondo, Baja California				El Hongo, Baja California				El Carrizo, Baja California			
	1986		1974-1986		1986		1981-1986		1986		1980-1986	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	86	34	90	21	77	36	77	23	86	43	86	34
Feb.	88	32	95	23	81	27	81	21	86	37	88	36
Mar.	88	32	90	27	79	32	79	28	88	43	88	36
Apr.	99	37	99	32	84	34	86	30	91	43	95	39
May	95	39	106	39	91	37	100	36	91	46	102	43
June	97	48	113	41	102	46	102	39	93	50	106	48
July	100	48	111	48	99	50	106	45	91	52	109	52
Aug.	*	*	113	46	100	59	106	46	100	50	109	52
Sept.	100	45	115	39	97	41	97	37	91	50	106	48
Oct.	91	45	115	39	81	39	90	32	86	48	97	43
Nov.	86	41	97	28	73	34	82	28	95	43	95	39
Dec.	86	36	91	30	77	28	77	25	81	39	86	36
Yearly	100	32	115	21	102	27	106	21	100	37	109	34

Month	Belen, Baja California											
	1986		1965-1986									
	Max.	Min.	Max.	Min.								
Jan.	77	32	93	21								
Feb.	86	32	90	21								
Mar.	86	36	97	25								
Apr.	91	39	97	27								
May	95	37	104	32								
June	104	37	109	37								
July	97	39	113	39								
Aug.	100	41	113	41								
Sept.	102	34	111	34								
Oct.	90	34	104	21								
Nov.	86	37	93	25								
Dec.	79	34	91	19								
Yearly	104	32	113	19								

* Missing data

DRAINAGE AREAS ABOVE GAGING STATIONS AND IRRIGATED AREAS
ALONG TIJUANA RIVER AND TRIBUTARIES

1986

The total area within the Tijuana River basin is 1,731 square miles, as determined from the best available maps from both the United States and Mexico. The drainage areas shown below are tabulated according to their downstream sequence.

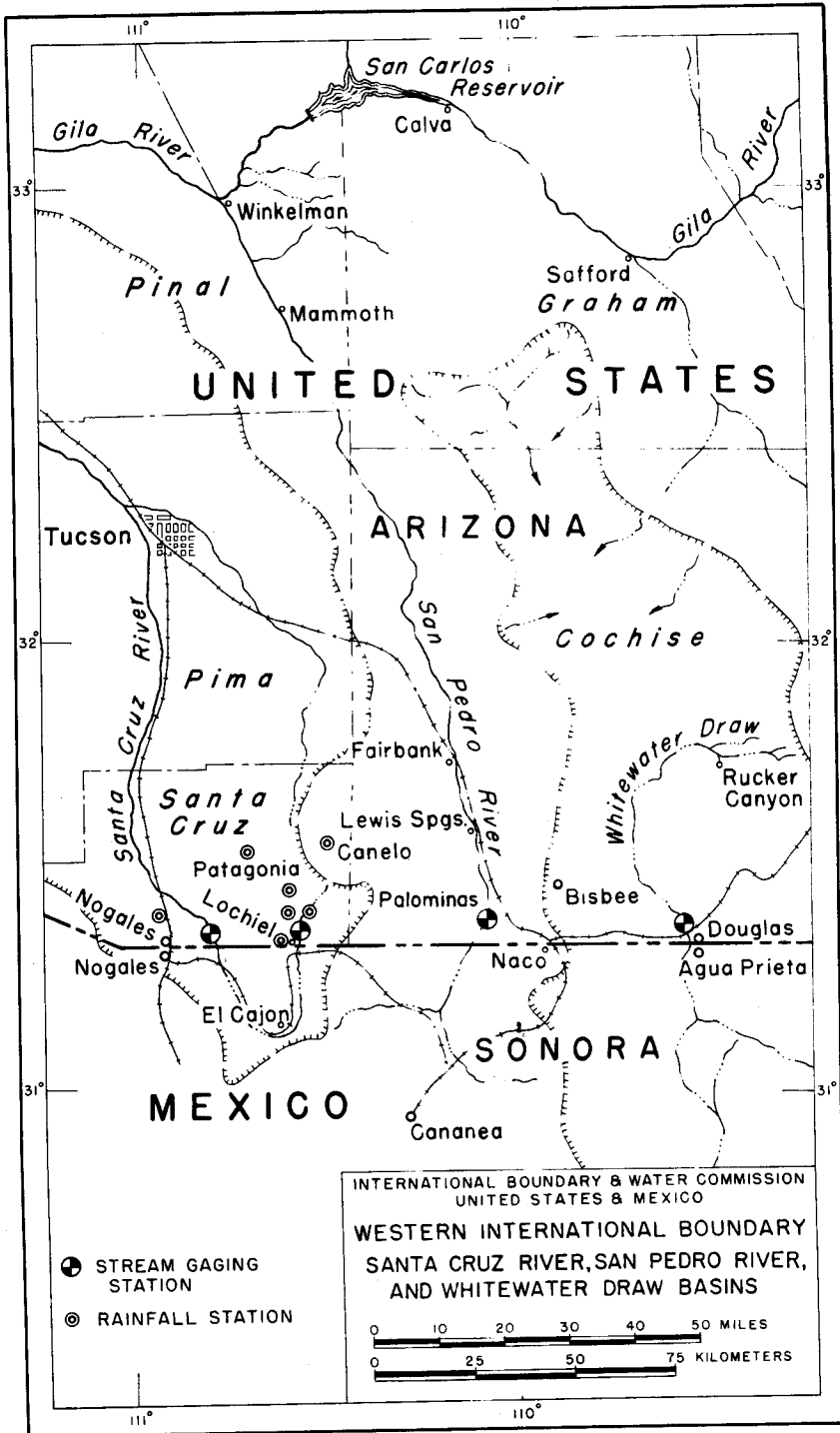
The irrigated areas, tabulated in downstream sequence, are from the most reliable sources available. Those in the United States were furnished by the Tijuana River Valley Association or estimated from aerial photographs. Those in Mexico were furnished by the Ministry of Agriculture and Hydraulic Resources of Mexico through the Mexican Section of the Commission. All irrigation in the Tijuana River basin in 1986 was by pumping from ground water.

Designation of Areas	Drainage Basin-Square Miles			Irrigated Areas-Acres		
	United States	Mexico	Total	United States	Mexico	Total
Cottonwood Creek above Morena Dam	114	0	114	0	0	0
Morena Dam to Barrett Dam	133	0	133	0	0	0
above Barrett Dam	247	0	247	0	0	0
below Barrett Dam and above Tecate Creek	65	0	65	0	0	0
above Tecate Creek	312	0	312	0	0	0
Campo Creek above International Boundary	82	4	86	0	0	0
Tecate Creek above International Boundary (not including Campo Creek)	19	64	83	0	0	0
Cottonwood Creek above International Boundary Station	413	68	481	100	0	100
Rio de las Palmas above Rodriguez Dam	7	981	988	0	(b) 0	0
Tijuana River above Nestor Gaging Station	458	1,266	1,724			
above the Mouth	462	1,269	1,731	(a) 625	(c) 0	625

(a) Data from Tijuana River Valley County Water Users Association.

(b) Areas in upper valleys may be irrigated by pumping from ground water.

(c) There was no irrigation in 1986 in the Tijuana Irrigation District, Tijuana Valley, Baja California Mexico, from the Rodriguez Reservoir.



WHITEWATER DRAW NEAR DOUGLAS, ARIZONA

DESCRIPTION: Water-stage recorder located on U. S. Highway 80 bridge between Douglas and Bisbee, Arizona, about 450 feet (137 m) upstream from the Southern Pacific Railroad bridge, 1.5 miles (2.4 km) upstream from the international boundary, and 2 miles (3.2 km) west of Douglas, Arizona. Zero of gage is 3,909.14 feet (1,191.51 m) above mean sea level, U. S. C. & G. S. datum of 1929. Location April 26, 1972 to April 10, 1974 was 200 feet (61.0 m) upstream from bridge. Datum 4.40 feet (1.34 m) higher.

RECORDS: Based on current meter measurements or observations of no flow during the year. Computations by shifting control methods. Records obtained and furnished by the U. S. Section of the Commission. Records fair. Records available: August to October 1911 (gage heights and discharge measurements only), July to October 1912, January to June 1913, October 1913, December 1913 to June 1914, February to June 1915, October 1915 to September 1919, October 1919 to April 1922 (gage heights and discharge measurements only), July 1930 to December 1933, May 1935 to July 1947, October 1947 through 1986 (July 1954 to March 1955, monthly discharge only).

REMARKS: Diversions above this station are mainly by pumping from ground water for irrigation. Records show flow at the international boundary into Mexico except for some smelter waste water entering the stream a short distance below this station.

EXTREMES: Prior to 1936: Maximum recorded discharge, 3,450 second-feet (97.7 m³/sec) August 10, 1931 (gage height 12.15 feet (3.70 m); maximum estimated discharge, 4,050 second-feet (115 m³/sec) July 27, 1919; minimum discharge, no flow for several days of many years. Since 1936: Maximum discharge, 5,060 second-feet (143 m³/sec) August 7, 1955; maximum gage height, 16.55 feet (5.04 m) July 29, 1966; minimum daily discharge, no flow at times during most years.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.1	0.1	0	0	0	0	0.1	0	526	0.1	0	0.1
2	0.1	0.1	0	0	0	0	0.1	0	313	0.1	3.5	0.1
3	0.1	0.1	0	0	0	0	4.2	0	165	0.1	0.6	0
4	0.1	0.1	0	0	0	0	7.4	0	90.7	0.1	0.4	0
5	0.1	0.1	0	0	0	0.1	0.8	0	50.0	0.1	0.3	0
6	0.1	0.1	0	0	0	0.2	0	0	28.6	0.1	0.1	0.1
7	0.1	0.1	0	0	0	0	0	0	16.4	0.1	0.1	0.1
8	0.1	0.1	0	0	0	0	0	0	10.1	0.1	0.1	0.1
9	0.1	0.1	0	0	0	0	0	0	115	0.1	0.1	0.1
10	0.1	0.1	0	0	0	0	0	0	102	0.1	0.1	0.1
11	0.1	0.1	0	0	0	0	0.1	2.8	6.5	0.1	0.1	0.1
12	0.1	0.1	0	0	0	0	8.5	4.6	4.1	0.1	0.1	0.1
13	0.1	0.1	0	0	0	0	36.2	16.6	2.7	0.1	0.1	0.1
14	0.1	0.1	0	0	0	0	13.6	339	1.9	0.1	0.1	0.1
15	0.1	0	0	0	0	0	4.0	50.1	1.3	0	0.1	0.1
16	0.1	0	0	0	0	0	14.7	5.7	0.9	0.1	0.1	0.1
17	0.1	0	0	0	0	0	0.2	0.4	0.6	0.1	0.1	45.0
18	0.1	0	0	0	0	0	11.4	987	0.5	0	0.1	63.3
19	0.1	0	0	0	0	0	1.2	349	0.4	0	0.1	0.9
20	0.1	0	0	0	0	0	0	17.7	0.2	0	0.1	0.2
21	0.1	0	0	0	0	0	0	18.3	0.1	0	0.1	0.1
22	0.1	0	0	0	0	0	0	13.6	0.1	0	0.1	0.1
23	0.1	0	0	0	0	0	0	10.2	0.1	0	0.1	0.1
24	0.1	0	0	0	0	0	0	6.9	20.4	0	0.1	0.1
25	0.1	0	0	0	0	0	0	5.1	0.1	0	0.1	0.1
26	0.1	0	0	0	0	0	0	18.5	0.1	0	0.1	0.1
27	0.1	0	0	0	0	7.5	0	38.8	0.1	0	0.1	0.1
28	0.1	0	0	0	0	0.5	0	29.0	0.1	0	0.1	0.1
29	0.1	0	0	0	0	0	0	46.8	0.1	0	0	0.1
30	0.1	0	0	0	0	0	0	656	0.1	0	0	0.1
31	0.1	0	0	0	0	0	0	678	0	0	0	0.1
Sum	3.1	1.4	0	0	0	8.3	102.5	3,294.1	1,457.2	1.6	7.1	111.8
Current Year 1986									Period 1936-1986			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	4.94	4.82	11	0.1	11	0.1	0.1	6.1	35.1	451	0	
Feb.	4.95	4.65	11	0.1	114	0	0.1	2.8	17.8	132	0	
Mar.	4.72	4.70	11	0	11	0	0	0	24.7	295	0	
Apr.	4.70	4.70	11	0	11	0	0	0	17.1	173	0	
May	4.70	4.70	11	0	11	0	0	0	12.4	138	0	
June	6.25	4.65	27	61.8	11	0	0.3	16.5	116	1,590	0	
July	6.75	4.60	15	145	11	0	3.3	203	1,847	8,110	0	
Aug.	10.06	4.57	18	1,540	11	0	106	6,534	2,965	14,480	0	
Sept.	8.14	4.66	1	673	121	0.1	48.6	2,890	770	3,170	0	
Oct.	4.72	4.62	11	0.1	114	0	0.1	3.2	364	6,103	0	
Nov.	5.76	4.61	2	22.5	11	0	0.2	14.1	33.5	352	0	
Dec.	6.77	4.65	18	146	13	0	3.6	222	111	2,363	0	
Yearly	10.06	4.57		1,540		0	13.7	9,892	6,314	22,321	235	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	3.07	1.39		43.6		0	0.39	12,202	7,788	27,533	290	

1 And other days

SEWAGE INFLUENT, DOUGLAS, ARIZONA
INTERNATIONAL TREATMENT PLANT

DESCRIPTION: Parshall flume in the influent line of the older trickling filter unit and a Parshall flume in the influent line of the newer extended aeration unit. The treatment plant is located about one mile (1.6 km) west of the Douglas-Agua Prieta Port of Entry immediately adjacent to the international boundary in Douglas, Cochise County, Arizona.

RECORDS: Continuous monthly records since March 1948; daily records from March 18, 1948 through 1950 and from January 1952 through 1986.

REMARKS: The older 1.3 mgd trickling filter unit was constructed in 1947 by the International Boundary and Water Commission. Since April 8, 1968 all sewage from Agua Prieta has been retained in Mexico to be used for irrigation along with the effluent from the Douglas International Treatment Plant. On July 1, 1973, ownership and operation of the plant was transferred from the International Boundary and Water Commission to the city of Douglas. In 1980 the plant was enlarged, with the addition of the extended aeration unit bringing the total capacity up to 2.6 mgd. The effluent from the Douglas Treatment Plant is discharged through a closed conduit to Mexico.

Month	Total Monthly Flows			Mean Daily Flows-Millions of Gallons Per Day					
	Millions of Gallons			Current Year 1986			Period 1952-1986		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	42.453	0	42.453	1.546	1.213	1.370	2.157	0.416	1.092
Feb.	37.853	0	37.853	1.754	.906	1.352	1.784	.543	1.095
Mar.	41.870	0	41.870	1.532	1.135	1.350	1.932	.590	1.095
Apr.	40.447	0	40.447	1.539	1.201	1.348	2.047	.380	1.099
May	40.761	0	40.761	1.569	1.127	1.314	1.850	.510	1.100
June	40.003	0	40.003	1.535	1.102	1.334	2.060	.555	1.153
July	42.169	0	42.169	1.481	1.219	1.360	3.209	.483	1.204
Aug.	41.604	0	41.604	1.528	1.197	1.342	2.681	.365	1.220
Sept.	40.920	0	40.920	1.551	1.138	1.363	1.904	.470	1.177
Oct.	41.042	0	41.042	1.465	1.185	1.323	1.945	.603	1.139
Nov.	40.050	0	40.050	1.710	1.196	1.335	1.710	.587	1.117
Dec.	41.691	0	41.691	1.449	1.215	1.344	3.330	.500	1.115
Yearly	490.863	0	490.863	1.754	0.906	1.345	3.330	0.365	1.134

SEWAGE INFLUENT, AGUA PRIETA, SONORA
INTERNATIONAL OXIDATION PONDS

DESCRIPTION: Parshall flume equipped with staff gage in influent line to oxidation ponds. Since April 8, 1968, all sewage from Agua Prieta, Sonora has been diverted to oxidation ponds, which are located in Mexico; if necessary, sewage from Douglas, Arizona may be included, but this has never been done.

RECORDS: Discharges are computed from daily 11:00 a.m. readings of the staff gage by applying an index for that hour, determined from 7 days of hourly measurements from which the relationship between mean daily readings and 11:00 a.m. readings was developed. Records available: Mean daily flows from April 8, 1968 through 1984.

REMARKS: The construction of the international oxidation ponds in Agua Prieta, Sonora was completed in April 1968 by the government of Mexico, fulfilling an international agreement to solve the problem of insufficient capacity at the international treatment plant in Douglas, where the combined flows from Douglas and Agua Prieta were treated. If necessary, sewage from Agua Prieta may be treated in this plant, but since the completion of the oxidation ponds, this has never been done. The ponds are located 1.6 miles (2.6 km) south of international monument 85a.

DATA FOR 1985 AND 1986 NOT RECEIVED IN TIME FOR PUBLICATION IN THIS BULLETIN.

SAN PEDRO RIVER AT PALOMINAS, ARIZONA

DESCRIPTION: Water-stage recorder located near left bank on downstream side of the bridge pier at Highway 92, 0.7 mile (1.1 km) east of Palominas, 2.5 miles (4.0 km) upstream from Green Brush Draw, 4.5 miles (7.2 km) downstream from international boundary, and 12 miles (19 km) southwest of Bisbee, Arizona. Zero of gage is 4,187.62 feet (1,276.39 m) above mean sea level (State Highway bench mark).

RECORDS: Based on current meter measurements or observations of no flow during the year. Records available: May 1930 to October 1933, May 1935 to July 1941, and July 1950 through 1986. Records obtained and furnished by U. S. Geological Survey to September 30, 1981; thereafter by the United States Section of the Commission.

REMARKS: There are some small diversions for irrigation of a few hundred acres above this station, mostly in Mexico. Record shows approximate flow of river at international boundary.

EXTREMES: Maximum daily discharge, 22,000 second-feet (623 m³/sec) on August 14, 1940 (gage height 16.16 feet (4.93 m) present datum), from rating curve extended above 5,600 second-feet (159 m³/sec) on basis of slope-area measurement of peak flow; no flow at times in most years. Greatest flood known occurred on September 28, 1926 (gage height, about 23.9 feet (7.28 m) present datum, from flood marks; discharge not determined.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.4	11.2	13.3	8.1	3.5	0.3	0	2.3	129	2.9	3.5	4.9
2	10.0	13.1	12.3	7.3	3.2	0.2	0.7	32.0	81.1	3.3	4.0	5.0
3	10.4	12.8	11.4	7.0	2.8	0.1	2.7	22.7	53.8	3.6	8.6	5.3
4	10.3	12.7	10.6	7.0	2.5	0.1	111	13.7	36.1	3.0	6.2	4.4
5	10.7	11.7	10.2	6.7	2.3	0.1	9.4	8.1	26.7	3.0	3.8	4.4
6	10.9	11.5	9.6	5.9	2.1	0	1.7	7.2	20.2	2.8	3.7	4.6
7	10.3	10.7	9.7	6.0	0.7	0	0.7	15.1	15.7	2.6	3.5	5.2
8	10.7	10.8	9.6	6.3	0.3	0	0.7	27.3	12.2	2.5	2.6	4.5
9	10.5	27.3	9.3	7.4	0.2	0.2	10.3	16.4	9.7	2.8	3.6	4.3
10	10.2	45.2	9.3	7.0	0.3	0.5	60.0	28.8	27.5	3.7	4.2	4.3
11	9.6	46.4	10.4	6.6	0.3	0.7	97.4	182	11.6	4.2	4.6	4.2
12	9.8	37.0	9.3	6.6	0.2	0.7	26.9	55.4	7.9	4.4	5.3	4.2
13	9.8	28.7	9.6	5.7	0.2	0.9	28.6	38.3	6.5	3.7	5.5	3.9
14	10.0	22.9	11.6	5.7	0.1	0.9	26.4	49.8	4.9	3.5	5.7	7.5
15	10.0	21.2	9.8	6.0	0.2	0.6	114	84.7	3.9	3.1	5.7	5.5
16	9.7	20.2	9.5	5.9	0.1	0.6	248	45.1	2.9	2.8	5.8	9.6
17	9.2	19.5	10.3	5.3	0.1	1.0	407	49.4	2.5	3.0	6.8	59.7
18	9.0	17.6	12.2	5.1	0.1	0.7	310	820	2.1	3.1	7.9	84.6
19	8.8	16.8	11.8	5.0	0.2	0.7	229	56.8	2.1	3.0	6.6	55.1
20	9.2	16.8	11.0	4.5	0.2	0.6	179	22.2	1.5	3.1	4.7	31.9
21	9.4	15.2	9.5	4.1	0.1	0.3	97.3	11.5	1.0	3.6	5.2	21.7
22	8.8	14.1	8.7	3.7	0.1	0.2	59.6	9.5	1.4	3.9	5.0	18.1
23	8.3	14.9	8.7	2.7	0.2	0.4	40.9	9.9	3.2	4.0	4.8	16.0
24	8.4	14.4	8.5	2.3	0.2	0.5	25.9	10.1	5.1	3.9	6.2	13.7
25	9.0	14.1	7.4	2.4	0.2	0.4	19.5	28.7	3.8	4.0	6.2	12.7
26	8.6	14.0	7.8	3.1	0.1	0.1	13.6	12.0	2.6	4.0	5.3	12.3
27	8.4	13.7	7.3	3.4	0.1	0	8.4	24.1	2.3	4.2	5.5	11.6
28	7.8	13.2	7.6	3.5	0.1	0	5.3	25.6	2.3	4.2	5.1	11.5
29	7.7		7.8	3.8	0.1	0	3.3	488	2.1	4.2	5.6	11.7
30	7.9		6.9	4.0	0.2	0	2.3	793	2.4	4.0	5.1	12.4
31	9.0		7.4		0.2		2.4	199		3.7		12.8
Sum	292.8	527.7	298.4	158.1	21.2	10.8	2,142.0	3,148.7	484.1	107.8	156.3	467.6
Current Year 1986									Period 1951-1986			
Month	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Low			Average	Maximum	Minimum		
Jan.	2.75	2.65	1	12.9	128	9.4	581	1,618	27,763	2.6		
Feb.	3.36	2.74	9	82.5	1	18.8	1,087	823	6,764	3.0		
Mar.	2.92	2.82	1	14.4	125	6.1	592	735	7,401	13.3		
Apr.	2.90	2.77	1	9.4	24	1.5	5.3	314	1,039	0		
May	2.82	2.36	1	4.3	114	0	0.7	42.0	67.3	0		
June	2.73	2.17	17	1.9	1	0	0.4	21.4	154	1,391		
July	5.92	2.44	17	87.1	1	0	69.1	4,289	5,500	17,238		
Aug.	9.73	2.78	18	4,130	1	1.2	102	6,285	8,483	36,369		
Sept.	4.06	2.62	1	175	21	0.2	16.1	960	1,919	16,344		
Oct.	2.78	2.67	111	5.1	1	1.9	3.5	214	2,019	47,322		
Nov.	2.96	2.70	3	15.2	8	1.5	5.2	310	272	2,563		
Dec.	3.64	2.79	17	122	11	3.1	15.1	927	1,783	25,479		
	9.73	2.17		4,130		0	21.4	15,502	23,555	62,788	4,400	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	2.97	0.66		117		0	0.61	19,121	29,055	77,448	5,427	

! And other days

SANTA CRUZ RIVER NEAR LOCHIEL, ARIZONA

DESCRIPTION: Water-stage recorder located in the United States near left bank on the downstream side of concrete bridge pier of county highway bridge, 2.5 miles (4.0 km) northeast of Lochiel, Arizona, and 1.7 miles (2.7 km) upstream from the international land boundary. The elevation of the zero of the gage has not been determined, but topographic maps indicate the elevation of the stream bed at the gage is about 4,620 feet (1,408 m).

RECORDS: Based on current meter measurements or observations of no flow during the year. Records obtained and furnished by the U. S. Geological Survey. Records available: January 1949 through 1986.

REMARKS: There are small diversions by ground water pumping for irrigating about 200 acres (80.9 ha) above this station.

EXTREMES: Maximum discharge, 12,800 second-feet (362 m³/sec) on August 15, 1984 (gage height 10.47 feet) (3.19 m); minimum discharge, no flow for several days of many years.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.5	3.5	1.3	0.84	0.91	0.67	0.83	7.5	15.0	3.6	1.5	1.2
2	1.5	1.7	1.2	.79	.91	.69	.55	1.1	14.0	3.5	1.7	1.2
3	1.5	1.4	1.2	.73	.87	.67	.50	0.72	13.0	3.2	1.5	1.2
4	1.5	1.5	1.2	.77	.83	.70	.51	.64	12.0	3.1	1.4	1.2
5	1.5	1.6	1.2	.78	.80	.68	.46	.66	11.0	3.1	1.4	1.2
6	1.5	1.3	1.2	.76	.76	.67	.43	.66	9.0	3.0	1.3	1.3
7	1.5	1.3	1.2	.70	.72	.67	.43	.68	8.0	2.9	1.2	1.3
8	1.5	1.5	1.2	.66	.71	.64	.69	.88	7.0	2.8	1.2	1.2
9	1.6	7.5	1.2	.66	.74	.63	.50	.73	6.0	2.9	1.2	1.2
10	1.6	2.0	1.2	.65	.77	.63	.45	.75	5.0	3.5	1.2	1.2
11	1.6	1.5	1.2	.66	.76	.62	.44	36.0	4.0	3.0	1.2	1.1
12	1.6	1.5	1.2	.69	.71	.61	.46	21.0	4.0	2.7	1.2	1.0
13	1.6	1.4	1.2	.66	.67	.60	.44	1.1	3.0	2.5	1.2	1.1
14	1.6	1.4	1.2	.62	.68	.61	3.2	.95	3.0	2.3	1.2	1.1
15	1.6	1.4	1.2	.62	.65	.50	1.6	.84	2.0	2.3	1.1	1.2
16	1.6	1.4	1.2	.63	.64	.44	1.7	6.1	2.0	2.2	1.2	1.5
17	1.6	1.4	1.3	.62	.63	.42	1.0	13.0	2.0	2.1	1.2	4.7
18	1.6	1.3	1.2	.63	.65	.39	.76	11.0	2.0	2.0	1.3	2.5
19	1.6	1.3	1.2	.63	.60	.34	.69	.95	2.0	1.8	1.2	1.8
20	1.6	1.3	1.2	.64	.58	.29	.66	.81	2.0	1.8	1.1	1.8
21	1.6	1.3	1.1	.65	.56	.28	.67	.80	2.0	1.7	1.1	1.8
22	1.6	1.3	1.2	.68	.53	.29	.68	.72	2.0	1.7	1.0	1.7
23	1.6	1.3	1.1	.77	.54	.31	.66	.74	2.0	1.7	1.0	1.7
24	1.4	1.3	1.1	.78	.56	.41	.61	.82	8.0	1.7	1.0	1.7
25	1.3	1.3	1.1	.72	.55	.45	.60	.83	5.0	1.7	1.1	1.6
26	1.3	1.3	1.1	.67	.58	.46	.59	14.0	4.0	1.7	1.2	1.6
27	1.3	1.3	1.1	.62	.57	.47	.59	6.0	4.0	1.7	1.2	1.6
28	1.3	1.3	1.0	.61	.55	.53	.61	1.4	4.0	1.7	1.2	1.5
29	1.3		.95	1.4	.64	.57	.59	560	4.0	1.6	1.3	1.5
30	1.3		.90	.92	.75	.68	.61	55.0	4.1	1.5	1.3	1.5
31	9.7		.86		.71		.60	17.0		1.5		1.5
Sum	54.9	47.6	35.71	21.56	21.13	15.92	23.11	763.38	165.1	72.5	36.9	47.7
Current Year 1986									Period 1949-1986			
Month	Extreme Gage Feet		#	Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low		Day	High			Day	Low	Average	Maximum	Minimum
Jan.			31	9.7	1.25	1.3	1.77	109	168	2,895	1.3	
Feb.			9	7.5	1.3	1.3	1.70	94.4	95.2	1,000	1.8	
Mar.			1	1.3	0.86	0.86	1.15	70.8	118	2,103	0.7	
Apr.			29	1.4	.28	.61	0.72	42.8	43.3	308	0	
May			1	0.91	.22	.53	.68	41.9	22.9	170	0	
June			4	0.70	.21	.28	.53	31.6	17.4	169	0	
July			14	3.2	1.6	.43	.75	45.8	545	4,270	1.6	
Aug.			29	560	4	.64	24.6	1,514	1,127	11,518	.08	
Sept.			1	15.0	1.15	2.0	5.50	327	337	2,634	0	
Oct.			1	3.6	1.30	1.5	2.34	144	333	4,732	0	
Nov.			2	1.7	1.22	1.0	1.23	73.2	64.7	403	0	
Dec.			17	4.7	1.2	1.0	1.54	94.6	118	1,093	0	
Yearly				560		0.28	3.58	2,589	2,990	17,376	126	
	Meters		Cubic Meters per Second					Thousands of Cubic Meters				
				15.9		0.01	0.10	3,193	3,688	21,433	155	

§ Mean daily

! And other days

SANTA CRUZ RIVER NEAR NOGALES, ARIZONA

DESCRIPTION: Water-stage recorder, cable with sit-down cable car located 5.5 miles (8.9 km) east of Nogales, Arizona, 0.8 mile (1.3 km) downstream from the international boundary and 6 miles (9.7 km) upstream from the Santa Cruz bridge on State Highway No. 82. Zero of gage is 3,702.54 feet (1,128.53 m) above mean sea level, U. S. C. & G. S. datum (levels by International Boundary and Water Commission).

RECORDS: Based on current meter measurements or observation of no flow during the year. Records obtained and furnished by the U. S. Geological Survey. Records available: March to November 1907 and April 1909 to December 1912 (discharge measurements and fragmentary gage height record); January 1913 to June 1922 (October 1915 to September 1916, monthly discharges only); May 1930 to December 1933; and July 1935 through 1986.

REMARKS: Diversions in both countries affect the flow at this station. The major diversions occur in Mexico for domestic and irrigation uses. There are no storage dams above the station as of December 1986.

EXTREMES: Maximum discharge, 33,500 second-feet (949 m³/sec) on October 9, 1977 (gage height 15.5 feet) (4.72 m); minimum discharge, no flow for several days of many years.

Mean Daily Discharge in Second-Feet 1986 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	21.0	19.0	25.0	14.0	3.6	1.4	7.5	11.0	69.0	17.0	14.0	11.0
2	21.0	22.0	25.0	14.0	3.1	1.4	4.5	44.0	47.0	16.0	14.0	11.0
3	21.0	23.0	24.0	13.0	2.8	1.3	3.4	42.0	43.0	17.0	14.0	11.0
4	21.0	23.0	28.0	13.0	2.5	1.4	3.2	12.0	40.0	16.0	14.0	11.0
5	20.0	21.0	30.0	13.0	2.3	1.5	2.3	7.5	38.0	16.0	14.0	11.0
6	20.0	18.0	29.0	13.0	2.2	1.2	1.7	6.9	32.0	16.0	14.0	10.0
7	19.0	19.0	28.0	12.0	2.1	1.2	1.4	6.2	28.0	15.0	14.0	10.0
8	18.0	21.0	28.0	12.0	2.2	1.1	1.7	30.0	25.0	15.0	14.0	9.9
9	18.0	159	26.0	12.0	2.2	1.3	1.6	13.0	48.0	15.0	14.0	9.9
10	17.0	85.0	26.0	12.0	2.2	1.4	3.3	21.0	37.0	15.0	14.0	9.9
11	17.0	54.0	31.0	11.0	2.0	1.4	29.0	24.0	35.0	14.0	14.0	9.9
12	17.0	48.0	29.0	11.0	1.8	1.4	4.2	61.0	32.0	14.0	13.0	9.6
13	17.0	40.0	28.0	11.0	1.5	1.6	2.8	32.0	29.0	14.0	13.0	9.1
14	17.0	32.0	29.0	10.0	1.5	1.7	25.0	21.0	27.0	14.0	13.0	9.1
15	17.0	29.0	27.0	8.2	1.2	1.8	327	18.0	25.0	14.0	13.0	9.1
16	16.0	27.0	25.0	7.0	1.1	2.1	367	50.0	24.0	14.0	13.0	9.3
17	16.0	26.0	31.0	6.9	0.91	2.7	404	42.0	23.0	14.0	13.0	12.0
18	16.0	25.0	51.0	6.9	0.78	2.4	285	35.0	22.0	14.0	13.0	12.0
19	16.0	25.0	72.0	6.8	0.67	1.5	97.0	29.0	21.0	14.0	13.0	11.0
20	16.0	25.0	42.0	7.2	0.58	1.0	40.0	22.0	20.0	14.0	12.0	10.0
21	15.0	25.0	37.0	7.1	0.46	0.82	24.0	20.0	19.0	14.0	12.0	9.9
22	15.0	26.0	36.0	6.7	0.45	0.69	21.0	17.0	18.0	14.0	12.0	9.9
23	14.0	25.0	33.0	6.2	0.61	0.34	20.0	14.0	18.0	14.0	12.0	9.9
24	14.0	25.0	29.0	6.1	0.73	0.46	19.0	14.0	49.0	14.0	12.0	9.6
25	14.0	24.0	25.0	5.5	0.70	0.72	17.0	22.0	49.0	14.0	12.0	9.6
26	14.0	24.0	20.0	5.1	0.74	0.24	16.0	30.0	24.0	14.0	11.0	9.9
27	14.0	24.0	18.0	4.9	0.80	0.03	15.0	44.0	21.0	14.0	11.0	9.9
28	15.0	25.0	17.0	4.5	0.71	0.47	14.0	47.0	19.0	14.0	11.0	9.7
29	15.0		16.0	4.4	0.68	1.7	14.0	170	18.0	14.0	11.0	9.9
30	16.0		16.0	4.2	1.4	2.3	12.0	824	17.0	14.0	11.0	9.9
31	16.0		15.0		1.4		11.0	109		14.0		10.0
Sum	523.0	939.0	896.0	268.7	45.92	38.57	1,794.6	1,838.6	917.0	452.0	385.0	314.0
Current Year 1986									Period 1936-1986			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			1	21.0	123	14.0	16.9	1,037	2,220	30,282	0	
Feb.			9	159	6	18.0	33.5	1,862	1,761	20,547	0	
Mar.			19	72.0	31	15.0	28.9	1,777	1,488	19,575	0	
Apr.			1	14.0	30	4.2	8.96	533	396	2,955	0	
May			1	3.6	22	0.45	1.48	91.1	122	1,031	0	
June			17	2.7	27	0.03	1.29	76.5	91.0	1,449	0	
July			17	404	7	1.4	57.9	3,560	2,829	15,610	45.0	
Aug.			30	824	7	6.2	59.3	3,647	5,826	45,790	91.0	
Sept.			1	69.0	30	17.0	30.6	1,819	1,555	9,431	0	
Oct.			1	17.0	111	14.0	14.6	897	1,980	59,025	0	
Nov.			1	14.0	126	11.0	12.8	764	558	7,384	0	
Dec.			117	12.0	113	9.1	10.1	623	2,631	33,568	0	
Yearly				824		0.03	23.0	16,687	21,457	87,615	2,234	
	Meters		Cubic Meters per Second					Thousands of Cubic Meters				
				23.3		0	0.65	20,583	26,467	108,072	2,756	

0 Mean daily

1 And other days

SEWAGE INFLUENT, NOGALES INTERNATIONAL TREATMENT PLANT

DESCRIPTION: Three 24-inch (61.0 cm) Parshall flumes, each with a water-stage recorder and continuous totalizer, one located at the international boundary for measuring effluent from Nogales, Sonora, one located at the head of the treatment plant, and one in the plant effluent line. Nogales International Treatment Plant is located adjacent to I-19, approximately 9 miles (14.5 km) north of the international boundary, all within the city of Nogales, Santa Cruz County, Arizona.

RECORDS: Flows from the United States are deduced from total plant influent less the flows measured crossing the international boundary from Mexico. Records available: Continuous monthly record for plant influent since August 1951; daily records for plant influent, January 1952 through 1986.

REMARKS: Prior to December 18, 1971 the plant was located along the right bank of Nogales Wash, approximately two miles (3.2 km) north of the international boundary. Nogales International Treatment Plant treats combined sewage from both Nogales, Arizona and Nogales, Sonora by means of aerated stabilization lagoons with a capacity of 8.2 mgd. Chlorinated plant effluent is discharged directly to the Santa Cruz River.

Month	Total Monthly Flows			Mean Daily Flows-Millions of Gallons Per Day					
	Millions of Gallons			Current Year 1986			Period 1952-1986		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	114.612	116.499	231.111	8.434	6.327	7.455	10.789	0.650	3.733
Feb.	112.126	148.544	260.670	11.991	7.746	9.310	13.523	.650	3.907
Mar.	117.807	167.505	285.312	10.706	6.879	9.204	18.861	.750	3.861
Apr.	108.412	152.718	261.130	9.155	7.311	8.704	10.902	.700	3.669
May	102.720	145.765	248.485	8.828	6.545	8.016	9.054	.550	3.495
June	94.668	131.911	226.579	8.495	6.821	7.553	8.495	.700	3.315
July	105.629	165.530	271.159	10.036	7.040	8.747	12.539	.700	3.538
Aug.	112.423	193.914	306.337	11.217	7.948	9.882	13.120	.750	3.885
Sept.	111.903	173.245	285.148	11.090	8.481	9.505	12.312	.800	4.096
Oct.	101.951	164.942	266.893	9.941	7.688	8.609	13.055	.700	3.992
Nov.	98.659	141.109	239.768	8.660	7.093	7.992	10.352	.800	3.855
Dec.	99.413	155.030	254.443	10.087	7.555	8.208	15.605	.350	3.870
Yearly	1,280.323	1,856.712	3,137.035	11.991	6.327	8.599	18.861	0.350	3.768

RAINFALL ON THE SANTA CRUZ RIVER WATERSHED IN INCHES

Tabulated below are the monthly records of rainfall with averages for their periods of record at stations located in Arizona. Two stations are operated and maintained by the United States Section of the Commission and two by the National Weather Service. For location, elevation, period of record, type of gage in use, and the observer, see alphabetical listing of stations on this page.

IN THE UNITED STATES

Month	San Rafael #2, Arizona		Canelo, Arizona		Patagonia, Arizona		Nogales Sanitation Plant 9N, Arizona			
	1986	Average 1973-1986	1986	Average 1930-1986	1986	Average 1930-1986	1986	Average 1953-1986		
Jan.	0.62	1.58	0.14	1.21	0.58	1.27	0.04	1.14		
Feb.	2.15	1.33	2.46	1.07	1.49	1.06	1.49	.75		
Mar.	2.87	1.35	1.78	.88	1.67	.94	1.04	.90		
Apr.	0	.48	1.63	.38	.75	.36	T	.24		
May	.97	.16	.52	.14	.28	.17	.51	.23		
June	1.82	.59	1.06	.79	.54	.49	.72	.41		
July	4.11	5.30	4.14	4.21	3.82	4.42	3.94	4.85		
Aug.	6.94	3.27	6.64	4.27	5.56	4.04	4.92	3.83		
Sept.	2.02	2.33	1.03	1.80	.80	1.82	.67	1.73		
Oct.	.38	1.32	.53	1.02	.41	1.07	.24	1.34		
Nov.	.28	1.03	.64	.82	.71	.82	.80	.66		
Dec.	2.93	1.51	2.25	1.40	2.23	1.42	2.14	1.43		
Yearly	25.09	20.25	22.82	17.99	18.84	17.88	16.51	17.51		

T Trace

LOCATION OF RAINFALL STATIONS ON THE SANTA CRUZ WATERSHED

The precipitation records of the stations listed alphabetically below begin on the date shown and extend through 1986.

IN THE UNITED STATES

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	OBSERVER
Canelo, Arizona	S	31° 33'	110° 32'	5,010	1930	R. E. Ewing
Nogales Sanitation Plant 6N, Arizona	S	31° 25'	110° 57'	3,560	June 1952	I. B. & W. C.
Patagonia, Arizona	S	31° 33'	110° 45'	4,190	1930	George R. Proctor
San Rafael #2, Arizona	S	31° 22'	110° 38'	4,860	Jan. 1973	I. B. & W. C.

S Standard 8" rain gage

TEMPERATURE IN THE SANTA CRUZ RIVER BASIN
IN DEGREES FAHRENHEIT .

Tabulated below are monthly records of temperature at the station located at the Nogales Sanitation Plant in Arizona 9 miles (14.5 km) north of the international boundary. On December 18, 1971, the station was moved to correspond with a new Nogales Sanitation Plant. Prior to this date, the station was located 2 miles (3.2 km) north of the international boundary at the old Nogales Sanitation Plant. This station is operated and maintained by the United States Section of the Commission. The equipment at the Nogales Sanitation Plant - 9N consists of a standard 8-inch (203 mm) rain gage and maximum and minimum thermometer. The collection of data for mean relative humidity, evaporation, and mean wind speed was discontinued in 1984.

For specific location of this station, refer to data opposite same station name shown in "Location of Rainfall Stations," page 84 of this bulletin.

Month	Nogales Sanitation Plant - 9N		
	1986		
	Mean	Max.	Min.
Jan.	50.6	82	23
Feb.	51.2	85	22
Mar.	56.2	87	29
Apr.	*	*	*
May	66.6	96	31
June	75.9	101	45
July	76.8	104	56
Aug.	79.6	100	63
Sept.	69.5	98	38
Oct.	61.2	86	30
Nov.	54.3	79	23
Dec.	46.2	76	18
Yearly		104	18

* Missing data

DRAINAGE AREAS ABOVE GAGING STATIONS AND IRRIGATED AREAS ALONG
SANTA CRUZ RIVER, SAN PEDRO RIVER, AND WHITEWATER DRAW

1986

The drainage basin areas tabulated below are derived from the best available maps from both the United States and Mexico.

Data on irrigated areas in the Whitewater Draw Basin were furnished by the Soil Conservation Service at Douglas, Arizona and estimated from aerial photographs.

Designation of Areas	Drainage Basin - Square Miles			Irrigated Areas - Acres		
	United States	Mexico	Total	United States	Mexico	Total
Santa Cruz River:						
Above Lochiel, Arizona Gaging Station	82	0	82	100	0	100
Above El Cajon, Mexico Gaging Station	179	125	304	100	2,352	2,452
Above Nogales, Arizona Gaging Station	185	348	533	100	2,696	2,796
San Pedro River:						
Above Palominas, Arizona Gaging Stations	92	649*	741	2,000	3,459	5,459
Whitewater Draw:						
Above Douglas, Arizona Gaging Station	1,023	0	1,023	22,000	0	22,000

* An additional 47 square miles in Mexico is tributary to the San Pedro River Downstream from this station.